WIRED

THE INFLUENCER MACHINE

HOW MICRO-CELEBRITIES ARE BECOMING THE NEW MEGA-LOBBYISTS.

by BENJAMIN WOFFORD

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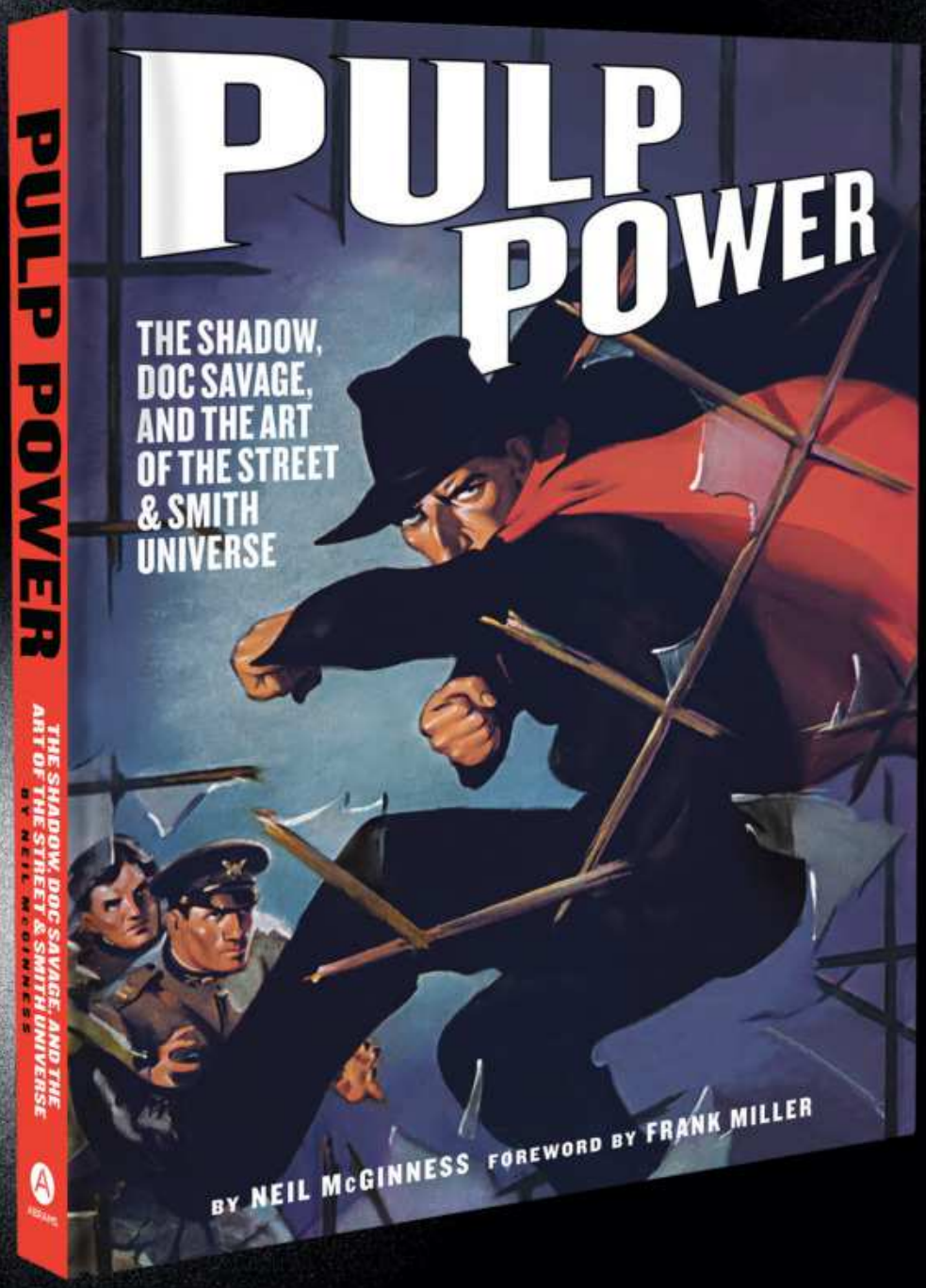

"This book is the ultimate collectible coffee-table book for anyone that loves the world of superheroes."

—FRANK MILLER, CREATOR OF *300* AND *SIN CITY*

"*Pulp Power* is the definitive account of how The Shadow and Doc Savage shaped the superhero-obsessed world of today."

—DAN DIDIO, FORMER PUBLISHER OF DC COMICS

From the Condé Nast Archives, *Pulp Power: The Shadow, Doc Savage, and the Art of the Street & Smith Universe* gives fans a rare glimpse into the prewar pulp-novel decades of the 1930s and 1940s, a period of bold action and adventure storytelling that ultimately led to the creation of superheroes we know and love today. Author Neil McGinness provides context for the cover illustrations alongside a rich narrative history of the characters and era and discussion of the influence of the Street & Smith heroes on creators such as Orson Welles, George Lucas, James Patterson, Walter Mosley, Dwayne Johnson, Jim Steranko, Jim Lee, Gail Simone, Steve Orlando, Gayle Lynds, and many more. The book also includes original line-art illustrations from the volumes, a unique collection of Shadow ephemera, cover art from the paperback boom of the '60s and '70s, and a look at the past, present, and future of the Street & Smith characters in comics. *Pulp Power* is the ultimate coffee-table collectible book for all who love the world of superheroes.

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BY NEIL McGINNESS

FOREWORD BY FRANK MILLER

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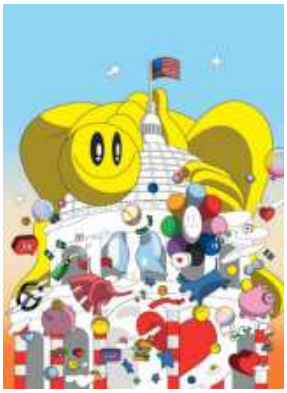

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CLOCKWISE FROM TOP: KENDRICK BRINSON, KELSEY MCCLELLAN, ZELOOT

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Readers share their disaster prep plans, hindsight, and awe.

In our July/August issue, Matt Ribel explored what would happen to the electrical grid if a coronal mass ejection were to spew from the sun and hit Earth. (Nothing good!) Maryn McKenna revisited the Delta outbreak in Provincetown, Massachusetts. And Katrina Miller reflected on the barriers she and other Black women physicists have faced in academia.

AKILAH TOWNSEND

RE: "STAR, DESTROYER"

We know the source and the damage a coronal mass ejection can inflict. We also know how to protect ourselves from catastrophe. But as the recent winter power failure in Texas shows, the utility companies are not ready for it. I'm glad to keep extra packages of grits and buckwheat around to soak in water. I just hope I can get some water!
—M. Barkan

This is a Covid-like scenario. With modest up-front cost and responsible planning, we can avoid a disaster. However, do you trust the patchwork of utilities across the country to do anything about it, besides ensuring you pay your electric bill each month?
—Dennis Yuscavitch, via Twitter

RE: "THE PROVINCETOWN BREAKTHROUGH"

Last July in Provincetown was rough. This article leaves out, for example, how difficult it was for local businesses to survive two summers of decreased footfall. Still, I've never been prouder to be part of this resilient little queer community.
—House, via Twitter

During the pandemic, I wondered why we weren't listening to the hard-earned lessons of queer people: centralize community, open communication, take care of others, destigmatize transmission. The goal is living, not surviving. As with AIDS, high levels of education and access to resources were central to the containment of Covid in Provincetown.
—Maria Rebolleda Gómez, via Twitter

Primed with knowledge and community norms from HIV/AIDS, as well as collaborative local, regional, and state leadership, Provincetown handled an unexpected outbreak with swift, competent action. As we face new public health crises, like monkeypox, we can use lessons from the Provincetown cluster.
—Julian Cyr, via Twitter

RE: "THE UNWRITTEN LAWS OF PHYSICS"

It's so hard to capture that odd mix of feeling invisible while also being in the spotlight as a minority. This piece does it so well through beautifully crafted storytelling.
—Passant Rabie, via Twitter

This took me back to being one of a few African American women in my MBA program and always feeling like an alien. Years later, the microaggressions haven't changed. These behaviors toward African American women are ingrained in the STEM programs at universities and jobs in the US. These ladies are all incredibly talented and make me so proud.
—Nicole D. Smith

This is a really effective illustration of what systemic racism looks like: The world-class physics PhD program at UChicago is about to graduate only its fourth black woman. Ever. The academic in me really wants to analyze and contextualize this, but coming from a white dude that would be a disservice and probably an insult to those who live this reality every day. Instead, I just want to amplify.
—Derek B., via Twitter

RE: "STAR, DESTROYER"

Prevent the end of civilization for the cost of a postage stamp? Sounds good to me!

—Gabriel Austin Henton, via Twitter

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DIARY OF AN ENTREPRENEUR

The Leaders of Saudi Arabia's Staffing Revolution

Afnan Sherbeeni is helping to transform the Saudi Arabian employment market.

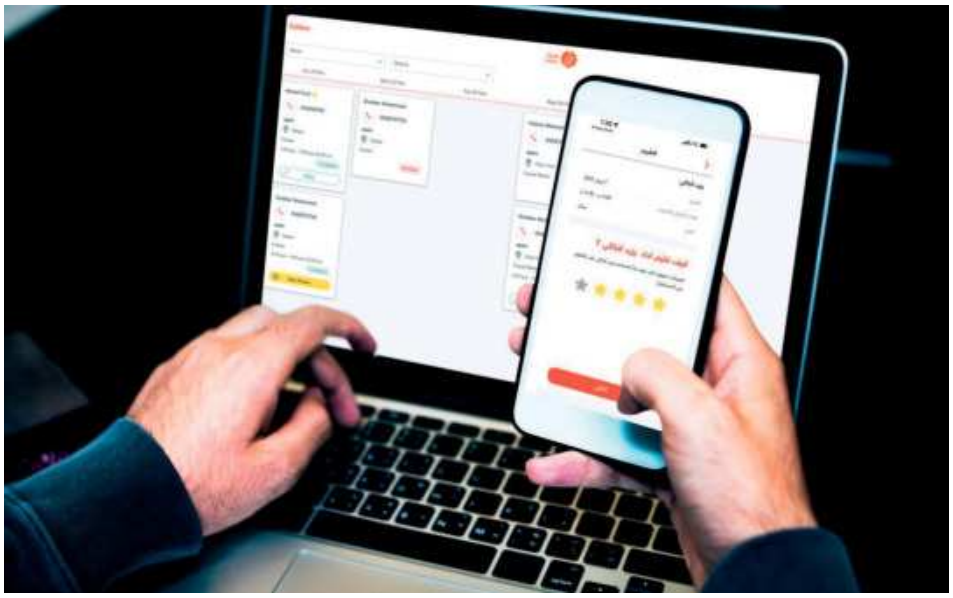
As co-founder of the flexible-staffing platform Sabbar, she is creating new opportunities for Saudis to gain experience, earn income, and pursue their dreams.

As the tech revolution sweeps across Saudi Arabia, the days of leaving resumes in shops, restaurants, and employment agencies have become ancient history for Saudi Millennials and Generation Z.

"The traditional way of working does not match the aspirations of the new generation," says Afnan Sherbeeni, who co-founded Sabbar, the on-demand staffing platform that matches busy recruiters with an ever-growing community of independent gig workers, in early 2019. "Saudis today want flexibility. They want to own their time. The culture has shifted."

The rise of Sabbar over the last three years reflects the changes that have taken place in Saudi Arabia since the launch of the Kingdom's Vision 2030 transformation plan six years ago. With tourists arriving from around the world, new hotels and restaurant chains opening across the country, and multi-billion-dollar investments being made in retail, hospitality, and entertainment, the demand for flexible staffing is high.

At Sabbar, the number of shifts that the platform fulfills has been increasing by as much as 40% per month. Major employers, such as IKEA and Domino's Pizza, rely on the start-up to help them find qualified workers fast. Sabbar takes care of costly and time-consuming processes, such as interviewing, vetting, and scheduling shifts, eliminating the many pain points of



Registering on Sabbar is easy and opens up opportunity employment

> “There has never been a better time to be a technology entrepreneur in Saudi Arabia”
>
> *Afnan Sherbeeni*
> Co-founder, Sabbar

recruitment for companies of all sizes.
At the same time, Sabbar serves as a fast track to a new world of opportunities for people across a country in transformation—from young workers entering the employment market to homemakers who want to earn income from temporary jobs on their own terms.

“Sabbar is changing lives,” Sherbeeni says. “As techies, we are used to spending our time in front of a screen, but when you see the impact that Sabbar is having on ordinary people, it is incredibly fulfilling for us all.”

Why did you launch Sabbar?
For employers, the recruitment of frontline workers is a major challenge. Turnover is high. The cost of recruitment and operations is rising. Companies want more flexible cost structures. Meanwhile, employees view positions in retail and hospitality mainly as ways to generate extra income, as opposed to long-term careers. Then there is the growth of the digital economy in alignment with Vision 2030. With my co-founders, Mohamed T. Ibrahim and Abdulrahman Al-Mudaiheem, we saw all these trends converging and launched Sabbar.

What sort of people use Sabbar to find work?
We are creating new opportunities for all sorts of people. Almost half the people on our database are women. Many of our workers are students who want to gain experience, pay for university tuition, or support their parents. One of the top performers on our platform is a full-time temp worker, who may work at a cookie store in the morning and at a pharmacy in the evening. She is enjoying it, she owns her time, and she meets different people and gains incredibly diverse experience. What people are looking for above all is flexibility, experience, and extra income.

One of the aims of Vision 2030 is to support flexible work and cater to these shifts in the culture and the economy. We are accelerating this move to a new model for work.

How does Sabbar make money?
We are commission-based on an hourly basis. We are paid by our corporate partners. They pay fees in addition to paying our workers. In fact, we are developing initiatives to increase the average monthly income per worker.

How are you funded?
In 2019 we raised seed money from a group of angel investors, most of whom are experts within the industry. Last year, in our second round, we raised $4.5 million from multiple venture capitalists in the region, including STV, Venture Souq, Derayah, and Seedra.

How has the community grown around entrepreneurs in Saudi Arabia?
The technology entrepreneurship scene has been transformed in Saudi Arabia. I have received huge support from everyone around me, from the team and the co-founders to private and public entities. We have benefited from a lot of mentorship, connections and programs for start-ups. The level of enablement has been amazing.

What is next for Sabbar?
We are looking to raise more funds. We want to scale up our training offer for employers. We want to expand into new, high-growth sectors, such as logistics and manufacturing. We are also aiming to provide financial services, such as micro loans for gig workers and small businesses. Geographically, we are planning to expand in the Middle East, North Africa, and Pakistan. This is an $11 billion market, and we are passionate about disrupting it.

SABBAR IN NUMBERS

130,000
workers are registered on Sabbar

300+
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98%
of Sabbar workers show up on time, all the time

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BY VIRGINIA HEFFERNAN | PHOTOGRAPH BY SHAWN MICHAEL JONES

EVERYTHING HAPPENS FOR NO REASON

It takes a lot of work to be lucky—unless it takes no work at all.

A

ALEXA'S APPROACH to prediction is a revelation: "Today you can look for sunny weather, with highs in the mid-70s." Go to town, scan the skies! You might get lucky.

Really, what more can or should be said about the future? Look around and see what happens. You can look for your crypto windfall. You can look for the love of your life. You can look for the queen of hearts. Seek and ye might find. You can even look for a four-leaf clover, though the chances are about 1 in 10,000. But if you find one, the shamrock is no less lucky because you looked for it. In fact, it's luck itself.

"Diligence is the mother of good luck" and "The harder I work the luckier I get"—these brisk aphorisms get pinned on Ben Franklin and Thomas Jefferson, lest we earnest Americans forget that salvation comes only to individuals who work themselves to dust. In truth, the *luck = work* axiom does nothing but serve the regime and the bosses, by kindling credulity in a phantom meritocracy instead of admitting that virtually *every single advantage* we get in the world is one we lucked into—by being born to the right parents who speak the right language in the right zip code. How about we *invert* the meritocratic fallacy in those aphorisms and create a new aphorism that makes "work" the delusion and "luck" the reality? "The luckier I get, the harder I pretend I've worked." An excellent way to describe the people born on third who believe they hit a triple.

After all, the chances of the precise sperm colliding with the exact egg in the right fallopian tube and convening to make you—or me—are so low as to be undetectable with human mathematics. The meeting that determines only 100 percent of your existence.

If there's any method of prediction that never fails, it's luck. You look for your horse—or your candidate—to win, and she wins? What luck. What if she loses? Better luck next time. If Alexa says you can look for rain, and you look and find it—lucky you, you brought an umbrella! Luck is fate and fate is what happens and a prediction of what happens is a perfect prediction.

Sure, for free-will buffs, being told that your sole agency lies in looking for luck, which you may or may not find, can be demoralizing. Perhaps that's why people tell themselves that luck is actually just hard work. We can *do* something about work—namely, do it.

But work and diligence can never be the parents of luck, because luck has no mother, no father, no precedent or context. Luck is a spontaneous mutation, signaling improbability; it shows up randomly, hangs around according to whim, and—as every gambler knows—makes an Irish goodbye. Mischievous luck is fun, a shamrock, a "lady." It's worlds away from grinding toil.

So where does the "looking for" luck come in? Ah—your agency comes in the almost-passive *search* for luck. The noticing. In 2018 the philosophy professor Steven Hales, along with one of his colleagues at Bloomsburg University, found that we're only as lucky as we think we are. We only find luck when we look for it. Better still—for those who like action items—luck begets luck. You look for sunny weather, you're more likely to find it; you find it, you come to think you're lucky; you try your luck looking for more sunny weather and you luck out again.

In *Aeon* magazine, Hales wrote, "Luck might not be a genuine quality of the world at all." Fine. But neither is beauty or justice. At the same →

In truth, the *luck = work* axiom does nothing but serve the regime and the bosses, by kindling credulity in a phantom meritocracy.

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time, the Bloomsburg researchers discovered "a significant positive correlation" between people's temperaments and how lucky they thought others were. "One of the things this means is that the more optimistic *you* are, the more you think *others* are lucky." For "optimistic," I might substitute "happy-go-lucky."

"Luck is a mere *façon de parler,* or turn of phrase," Hales wrote (using the Irish, of course). Of anyone who believes they're lucky, he went on, "their luck might well be, in a very strict psychological sense, entirely of their own making."

Of our own making! So you make your own luck by looking for it, but you also make it with lucky turns of phrase and lucky casts of mind. You see a friend who recovered from Covid as lucky for recovering, rather than unlucky for getting sick in the first place. And, if you're a happy-go-lucky type, you groove luck into your world by saying it, over and over. *Wow, you were lucky. Your sister had some stock and made you soup? What luck! Your system rallied? Boy, that's great genetic luck right there.*

Einstein didn't like the idea of God "playing dice" with the world. Lucky for Einstein, dice, in a world determined by luck, are not thrown by anyone, much less a God who is said to have Yahtzee skills. Instead, the chips fall where they may—and really they just fall, unpredictably, spontaneously. We then look for patterns in them.

For those seeking self-improvement, and who isn't, I'm not just freestyling here. Living by a doctrine of luck promotes at least five excellent things that have got to be good for your brain.

1. *Active skepticism about "meritocracy."*
2. *Recognition of the utter contingency of one's own advantages.* An act, if I may, of "checking your privilege."
3. *Appreciation for the spontaneity, serendipity, and unpredictability of the universe.* Nicholas Rescher, the illustrious philosopher at the University of Pittsburgh, calls luck "the brilliant randomness of everyday life."

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4. *A way to practice "gratitude" without doing calligraphy in $75 journals.* All you have you do is say, every time it hits you that life is OK and could be otherwise, "What luck!"
5. *A way to make more luck in your life.*

Luck really is the best creed. It makes no truth claims, requires no messiahs or gurus. It's not religious, partisan, or ideological. It doesn't just *allow* for surprise; it's nothing but surprise. It's charming. It may even be the secular answer to grace, but it comes with laughs rather than piety.

You make your own luck by looking for it, but you also make it with lucky turns of phrase and lucky casts of mind.

When you get good at luck, you can even find a spot of luck in a heat wave or your team's defeat. But don't be a psychopath. Luck is not about looking on the bright side. It's much more minor. It's about just *being*—and observing that, of all the prospective organisms in the broken but intriguing world, you happened, against the odds, to be one.

VIRGINIA HEFFERNAN *(@page88) is a regular contributor to* WIRED *and the author of* Magic and Loss: The Internet as Art.

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BY LAUREN GOODE | ILLUSTRATION BY ABBR. PROJECTS

CHATTER BLOCK

The live chats of the AOL days are now in our pockets and are do-not-disturbingly inescapable. Someone needs to bring back the AIM Away Message.

IN THE BEGINNING, there was AOL Instant Messenger. OK, not really. Talkomatic, CompuServe's CB Simulator, and Internet Relay Chat all preceded it. But AIM was the beginning of *something*, a gateway to real-time internet communication for the normies.

You didn't need to be a computer nerd to ride the AIM train. You popped the CD in the Gateway 2000, plugged your corded phone into a modem, and you were off. Actually, *on*. Very online, and very unaware at the time that the portal would disappear behind you, that you would never again live a wholly offline life.

AIM, which launched 25 years ago, represented that moment for me. It propelled me into a universe of limitless pixels and endless distractions. It was also a live social network. A digital door creaked open, and we all scrambled to see who had just signed on, who was down to chat.

Sometimes you had to step away. So you threw up an Away Message: I'm not here. I'm in class/at the game/Dad needs the comp. Here's an emo quote that shows how deep I am. Or, here's a song lyric that signals I am *so over you*.

I miss Away Messages, those text boxes full of possibility. But they were more than that. They were bits of code that constructed a Maginot Line around our availability. An Away Message not only popped up after someone IM'd you, it was visible to that person *before* they did.

Nothing like this exists today. Oh fine: There's Do Not Disturb and Focus modes on iPhone and iPad. Do Not Disturb and Schedule Send for Android OS. Mute Notifications on WhatsApp. The workplace chat app Slack offers Update Your Status, the closest thing we have to Away Messages. You can warn folks that you're OOO or slap a "sick" emoji on your profile. You can write "Writing, please DND." This, it turns out, is an invitation to be disturbed.

These are not guardrails. They're squishy orange cones that we all plow through like a 15-year-old in driver's ed. And the names of these features—Focus, Schedule Send—are phrases born of a work-obsessed culture. Bring back the ennui, the poetry, the pink fonts. Bring back being *away*.

What I'm reminiscing about is, of course, an entirely different protocol. There's instant messaging, and there's text messaging. Today the two are practically indistinguishable, but 25 years ago they were disparate experiences. AIM was a desktop client that pinged a server when you logged on, heralding your arrival to all the people on your Buddy List. Text messaging, on the other hand, mostly operated on cellular-connected mobile devices and heralded nothing.

The social interactions around these messaging forms were also distinctive. Think of it as synchronous versus asynchronous messaging, says former Apple engineer Justin Santamaria. Back when he was working on iChat, a precursor to iMessage (now Messages) that supported live AIM chats, the mentality was that text messaging "was very much about asynchronous communication, a kind of 'fire and forget' model," he says. "I send it, you receive it, and then you respond on your time."

Now, "asynchronous" messaging is the dominant form of text-based remote communications, Santamaria says. We're all glued to Messages, WhatsApp, WeChat, Telegram, and Signal on our phones, and in many instances we receive the same messages on our laptops. With that evolution, social contracts have changed.

Thing is, though, that synchronous/asynchronous distinction doesn't really make sense anymore: Asynchronous messaging *is* real-time chat now. That corded phone that dialed up and signed me on has morphed into a pocket computer that also happens to make phone calls. We can be reached at nearly any time. The dreaded ellipsis—the *dot dot dot* as someone types a response—holds us captive. We are all walking live chats.

Do Not Disturb. Focus mode. These are not guardrails. They're squishy orange cones that we all plow through like a 15-year-old in driver's ed.

Of course, some people (not me) are just better at managing their messages. Not long ago I was horrified and fascinated by a screenshot that a prominent tech CEO shared on Twitter, in which he inadvertently revealed that he had well over a hundred unread text messages. I inquired about this via DM, no doubt interrupting him, and he told me he treats his text messages much like he treats email. He triages, which is a very CEO thing to say. "I just respond to the stuff I need and mark anything as unread I need to get back to … the numbers don't stress me out."

This seems smart—although author Sam George might diagnose him with a totally made-up condition called Dyscommunication Syndrome, the basis for his book *I'll Get Back to You*. (I haven't read the entire thing; I've been too distracted by messages.) George makes a case for responding to messages quickly to clear them from your queue, rather than letting them sit or breaking the feedback loop entirely. Some of his advice is sound—take the conversation offline when possible and channel empathy when someone doesn't respond right away. The book also includes such gems as "What you do with a dick pic is up to you."

Lest I'm perceived by others as a communications curmudgeon, I'll own up to it: I'm a communications curmudgeon. People (myself included) send too many messages. The first step in making amends is to admit that you, too, are an inconsiderate messaging maniac.

But I'll never stop, and neither will you. Quick messaging has become one of the most efficient and meaningful forms of communication. It's crucial for relationship building, for organizing, for supporting others through hard times. It can be joyful. It's an accidental social network. It's not even accidental: Meta, née Facebook, knew exactly what it was doing when it acquired WhatsApp.

Would something like the AIM Away Message, a relic from an era when we didn't message so darn much, actually put up the guardrails we need? Maybe not. But at this point I'm willing to try anything. W

Senior writer **LAUREN GOODE** *(@LaurenGoode) covers consumer tech issues and trends.*

BY PAUL FORD | ILLUSTRATION BY ELENA LACEY

LET'S DISRUPT DISRUPTION

Now is the time to learn how to fetishize stability.

I USED TO co-run a software company. My cofounder is Lebanese, so we built a team in Beirut with an office right on the Levantine Sea. Great software engineers over there, excellent front-end talent. But Lebanon has been *going through it*. And not just in the normal "wedged between factions in an eternal global crisis zone" way. First the financial system collapsed (*no problem*, the team said), then the pandemic hit hard (*we're doing OK*), then Beirut was partially destroyed in a port explosion (*a terrible day, but we'll get through it*). Then we learned that people were powering their houses with DIY solar or diesel generators (*don't mention it*) and getting internet through mobile hot spots (*almost always works fine*). We rented spare apartments for folks having trouble getting home (*not necessary, but thanks*) and figured out how to pay people when the banks were melting (*appreciate it*). On January 6, 2021, they Slacked the US team, "Your coup is ridiculous."

All of which gave me a great appreciation for how boring America was. America was so boring for so long that other countries held their wealth in dollars, and oil oligarchs hoarded empty apartments in Manhattan. America was so boring that, for decades, the tech industry was able to make *disruption* its mantra. Young people would find some technology-enabled new thing; VCs would plump it up with cash, building a marketplace for new buyers and sellers; and established players would hilariously stumble all over themselves trying to compete. They'd fail, and we'd laugh. Need more progress? Just make more technology. Smartphones, drones, teledildonics, IoT—whatever, let's blow up the world again. →

You can't just say "software is eating the world" and chill. Software already ate the world, and digested it, and pooped out a new world, and that's where we're living.

Beating the Drum of Innovation

> Music is the language of the world. The one thing we all have in common is our love for music. Technology can help spread that love.
>
> *Arabian Prince*

On the streets of Compton, California, in the early 1980s, it was computer technology and electronics that helped DJ and musician Arabian Prince stay out of trouble and find fame as a founding member of legendary rap group N.W.A.

Now, his obsession for innovating and finding new ways of self-expression is taking him in an unexpected direction: to the thriving music industry of the Middle East.

"When I heard about how Middle East producers and musicians are pushing the boundaries and introducing innovative music ideas, I just knew I had to be a part of this new wave of creativity," says Arabian Prince.

Delegates at XP Music Futures in Riyadh are drawing a roadmap to the future of the Middle East music business

Digital technology has always been a passion for California-based rapper and music producer Arabian Prince. Now the founding member of N.W.A. is helping the Middle Eastern music industry embrace all the possibilities of digital innovation.

Arabian Prince will be one of the biggest names at the second XP Music Futures conference on the last three days of November in Riyadh, Saudi Arabia. Dedicated to forging a bright future for the music industry of the Middle East and North Africa (MENA), the conference will consist of interactive workshops, panel discussions, and multiple nightlife events, all designed to inject new energy and ideas into the regional music scene.

"XP stands for express, explore, and experience," says Talal Albahiti, the Chief Operating Officer of MDL Beast, which produces XP Music Futures and the giant Soundstorm festival that begins right after the conference. "XP Music Futures is a place where artists, managers, entrepreneurs, producers, and policymakers can meet, make connections, and help grow our industry all across the region."

It is the perfect setting for Arabian Prince to share his lifelong passion for using technology to transform music production and create new opportunities for promising young artists.

At the age of just 16, the rapper and songwriter used the proceeds from his first record to buy a computer and learn how to sequence music and write code. That led to a successful parallel career in animation and video game production.

Some four decades later, Arabian Prince says that he is amazed by the potential for recent innovations such as the blockchain and Non-Fungible Tokens (NFTs) to help creators monetize their music and receive fair royalty payments.

At the same time, digital technology has made it easier than ever for young artists to create music and find new audiences.

"In our day, we needed big synths, sequencers, and recording studios. The new generation can express themselves much quicker and create music from anywhere."

And from his vantage point of over forty years of experience in music and technology, Arabian Prince says the time is now right for the sounds of the Middle East to take on the world.

"Local producers are expanding their thinking. They are finding new possibilities to be innovative and introduce different music styles and fresh, authentic ideas. I cannot wait to see what this new journey will bring."

That type of progress definitely generates a ton of activity. But it also sits weird when you consider how many lives in the world, historically and currently, including American lives, are *extremely* disrupted—by toxic spills or the whims of royalty or the goats all swelling up and dying. Disruption is an ethos for the bored, for people who live in reasonable climates and don't have tanks in the street. But America has recently become way less boring.

I'm thinking of the photo of the dude wearing horns in the Senate chamber. Technologists are on the hook for that one. Because the internet begat the web, which begat social, which begat Trump, which begat *all that* and the Supreme Court, which unbegat *Roe*, and all I'm saying is that technology can't be responsible for only one kind of progress and wash its robot hands of the other. Borders aren't evaporating into the cloud; they're getting thicker. Distances are becoming more expensive to traverse. Grids are faltering. For several weeks this year it was tough to buy pretzels. You can't just say "software is eating the world" and chill. Software already ate the world, and digested it, and pooped out a new world, and that's where we're living.

I ONCE ENRAGED a client because I promised during a meeting to build them a "big, boring software platform." They took me to a fancy bar to yell at me. "We didn't pay you for boring!" they said. "We paid you for exciting!" I had to explain how, in tech, "boring" can be an asset, a way to build for growth, how things that look exciting, like New York City, are built on boring things, like sewage, or investment banking. An endlessly churning consumer economy might be fun in the moment—but have you ever seen the floor of the movie theater when the lights come up? (Of course I paid for the client's drinks.)

Stability is a hard sell, I'll grant you; the payoff is far away. No hominid ever thought, "If I poke this stick into a termite mound, then 50,000 generations from now my progeny will pay for five streaming services, including Peacock." They thought, "I am tired of chasing these termites all over the place when there's a veritable termite fountain over there." And suddenly, right then, they were eating the world. Humans are here for a good time, not a long time.

Fast-forward 50,000 monkey generations. Pretty clearly, now is the moment to learn how to fetishize stability. As I write, the asphalt in London is hot enough to heat your fish and chips. The solutions to the crisis (crises) are agonizingly long-term and require hundreds of trillions of dollars, with billions of people doing their part. What's a monkey with a stick to do?

In this, I think, the internet industry has a precedent to offer. The world of technology is infinite and exhausting, and everyone will tell you *their* giant thing is the real next thing. But you can always see the big, boring, true future of the field by looking at the on-ramps—the code schools, the certificate programs, the "master it in 30 days" books. One year everyone was learning Rails at coding boot camps. Then it was JavaScript. Then many of the boot camps closed, and now it's DevOps (software development plus IT operations). These are the things the industry needs right now, on a two- to five-year horizon. And stick around long enough and you'll find a lot of old Unix code and Java beneath the new stuff—dull systems, a stable stack of technologies so reliable that we forget them.

So I'm over progress and done with disruption. Stability is my new best friend. Not the big stuff, the UN-level stuff. Leave that to the smart macro-thinkers with European accents and interesting all-weather clothing, or the sad Americans with Substacks. What I'm going to work on, for the rest of my career in the tech industry, hand to God (OK, I'm an atheist and easily distracted, so caveat lector), is making nice little tutorials and tools—better sticks for kinder monkeys. I'm working on my first tutorial now, about how to parse NetCDF files full of climate data using the Python programming language to save the data to an SQL database and integrate it into a traditional web workflow. That's my DevOps! Who knows, maybe one day someone will open a school for stability. Everyone will want to run it, and no one will want to mop the floors.

PAUL FORD *(@ftrain) is a writer, programmer, and software entrepreneur. He lives in Brooklyn.*

An endlessly churning consumer economy might be fun in the moment—but have you ever seen the floor of the movie theater when the lights come up?

GETTY IMAGES

THE REAL ACTION IS OFF THE FIELD.

GQ SPORTS

WATCH AT youtube.com/gqsports

BY JACKIE SNOW | PHOTOGRAPH BY KENDRICK BRINSON

CODE OF CONDUCT

Inspired by her Indigenous heritage, Amelia Winger-Bearskin is injecting ethics into software.

WAMPUM.CODES WAS born of frustration. Amelia Winger-Bearskin had been working in the tech industry and teaching web development for a decade when she identified a big problem: Developers had very few options for building an ethical framework into their code—guidelines for how it should and shouldn't be deployed.

In 2019, a fellowship from Mozilla finally gave her the time and space to figure out a solution. Winger-Bearskin—an associate professor of AI and the arts at the University of Florida and a member of the Seneca-Cayuga Nation of Oklahoma, Deer Clan—drew inspiration from her Native American heritage. Her mother had been the tribe's storyteller, passing down tales and traditions that helped previous generations. The stories her mother told impressed on her how inseparable technology is from the society that builds it. "There are lessons about how to act, there are lessons about how to think, and there are lessons about scientific discoveries," Winger-Bearskin says. "And usually all of those things are happening in the exact same story. They're completely interdependent."

In 2020 she started a project called Wampum.Codes to explore how Indigenous values of co-creation—which reject top-down decisionmaking—can guide ethical technology development. Wampum.Codes began as a podcast, taking its name from the beads some tribes in North America wove into patterns for use as currency or to keep track of contracts and laws. Winger-Bearskin eventually transformed Wampum.Codes into a toolkit that provides simple ways of adding ethics to the list of factors that developers must consider when designing software.

"We might all have the same values," Winger-Bearskin says. "But what happens when we have this code and we're building it? That might mean something very different to a lot of people." Like beads woven together, Wampum .Codes can look different depending on who assembles them. The result is often a package.json—a human-readable file that developers typically use as a sort of instruction manual for what the software requires to work, such as external code bases. But instead of focusing on technical aspects, Wampum.Codes describes how the developer wants their code used and lays out specific circumstances in which it can and cannot be deployed. If you want your code to be used only for nonprofit causes, for instance, or to be barred from military applications, that information is embedded in the file.

Winger-Bearskin has put the instructions for Wampum.Codes online and has conducted more than two dozen workshops at places like Kickstarter and Mozilla, as well as cryptocurrency startups. The workshop mimics a typical software development project: Participants craft the ethical framework, stress-test it in different circumstances, and figure out how to hold themselves and others accountable if their code is used in ways that go against the guidelines. "I am not going to teach them about my ethics and values," Winger-Bearskin says. "I'm going to help the team surface theirs."

Wampum.Codes falls into Winger-Bearskin's wider research on what she calls antecedent technology: Indigenous tools and systems that preceded European contact. Wampum was essentially a decentralized, immutable ledger that was created by consensus and not controlled by a central authority—it could be considered the world's first blockchain. There's also quipu, a system of knots on strings used by Incans to store data such as tax information; the third-century technique is Turing-complete, which means it's robust enough to solve any computational problem.

Winger-Bearskin believes we can learn from the tools that have aided Native societies for centuries and that the values embedded in such systems can guide today's developers. "In the United States, we have a longer history of a decentralized economy than we have of a centralized one," she says, speaking about the blockchain and its forebears. "There are a lot of inspirational things we can learn if we think of that as part of the history of this technology." Get ready for the beadchain.

→ Amelia Winger-Bearskin, creator of Wampum.Codes, an ethics tool for developers.

JACKIE SNOW *(@jackiesnow) is a multimedia journalist based in Los Angeles.*

BY ARIELLE PARDES | ILLUSTRATION BY ABBR. PROJECTS

POP GOES THE BUBBLE

As crypto startups face a "crucible moment," are their hard times a harbinger for everyone else?

BACK IN MAY, the VC firm Sequoia Capital circulated a memo among its startup founders. The 52-page presentation warned of a bumpy road ahead, with inflation, rising interest rates, a Nasdaq drawdown, supply chain issues, and war in Ukraine. Things were about to get tough, and this time venture capital wouldn't be coming to the rescue. "We believe this is a Crucible Moment," the firm's partners wrote, advising companies to cut costs if they wanted to "avoid the death spiral."

Plenty of startups seem to be taking Sequoia's advice. As founders and CEOs have slashed the excesses of 2021 from their budgets, the mood has become downright funereal. Nearly 28,000 startup employees have been laid off since the start of June, according to Layoffstracker.com, which catalogs job cuts. Since the beginning of the year, the tally is more than 76,000.

The carnage has been especially grisly in the crypto industry. In mid-June, Coinbase laid off 1,100 employees, abruptly cutting their access to corporate email and Slack accounts. This came just days after the company rescinded job offers to more than 300 people who had planned to start their new positions within weeks. Two other crypto startups—BlockFi and Crypto.com—each cut hundreds of jobs in June; the crypto exchange Gemini also laid off about 10 percent of its staff. Collectively, more than 4,000 employees of crypto startups have lost their jobs since the beginning of June—nearly 15 percent of all startup cuts during the period.

The conversation around crypto companies has changed abruptly in the past year. In 2021 they were the darlings of venture capitalists, who showered them with billions of dollars to fund aggressive growth. Coinbase, which went public in April 2021 at $328 a share, seemed to confirm that the sector was an emerging gold mine. Others, like BlockFi, began hiring aggressively with ambitions to go public. Four crypto startups took out prime-time ads for the most recent Super Bowl.

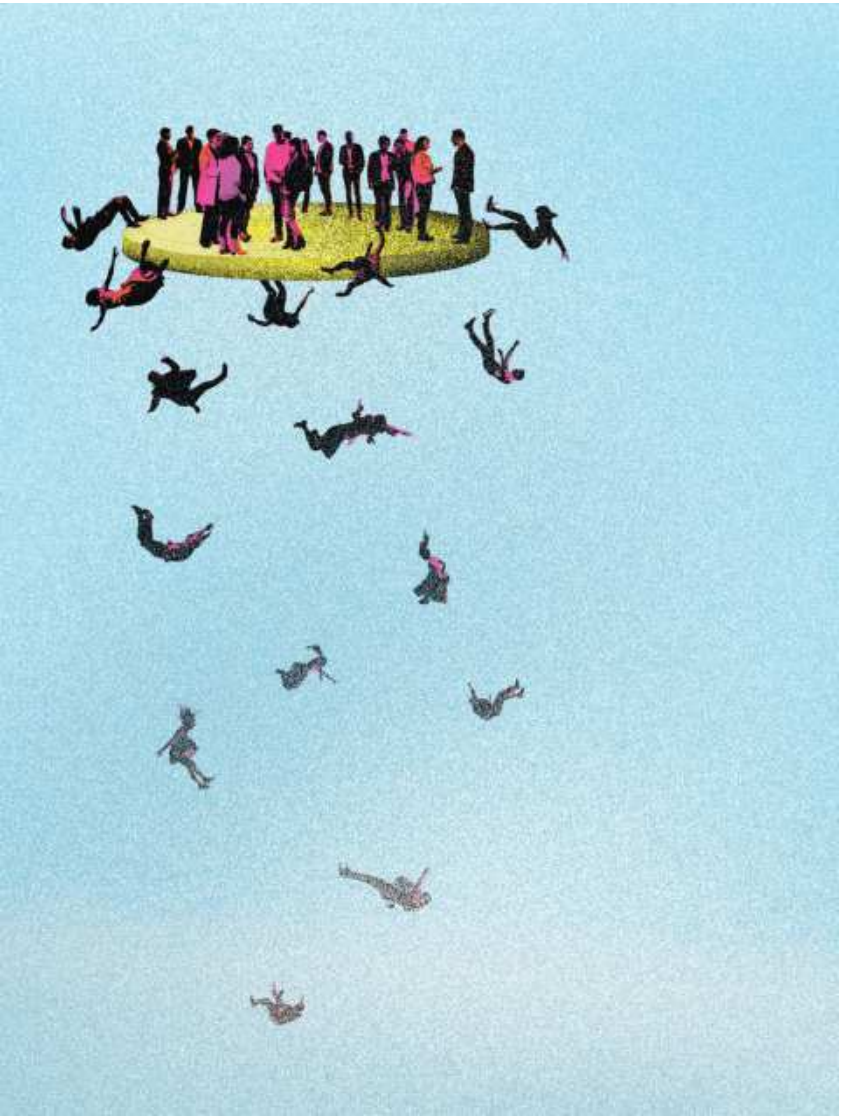
Coinbase was also focused on hypergrowth, scaling its staff from 1,250 in early 2021 to about 5,000 by 2022. "It is now clear to me that we over-hired," CEO Brian Armstrong wrote in a blog post announcing the layoffs. "We grew too quickly."

"It could be that crypto is the canary in the coal mine," says David A. Kirsch, associate professor of strategy and entrepreneurship at the University of Maryland's Robert H. Smith School of Business. He describes the contractions in crypto startups as one potential signal of "a great unraveling" for other fledgling companies that made big promises and can't deliver.

Kirsch is the author of *Bubbles and Crashes*, a chronicle of boom-bust cycles in tech. He says that bubbles tend to pop first in high-leverage, high-growth sectors. When the Nasdaq fell in 2000, for

Senior writer **ARIELLE PARDES** *(@pardesoteric) covers startups, Silicon Valley, and death spirals.*

READOUT SOURCES: INTERNAL MESSAGES FROM WITHIN CRUISE; INTERNATIONAL TELECOMMUNICATION UNION; HUGGING FACE; BLOOMBERG.NEF. ILLUSTRATION BY ELENA LACEY



example, the value of most ecommerce companies vanished "well in advance of the broader market decline." Companies like Pets.com and eToys.com—which had made big, splashy public debuts—eventually went bankrupt. In today's market, crypto startups are similarly exposed. "We could be seeing the collapse in that sector first," Kirsch says.

Crypto, its critics will say, was always a house of cards—so it's no surprise the industry is tumbling now. Advocates argue that it's normal to oscillate between periods of exuberance and destitution, called "crypto winters." Chris Dixon, a general partner at Andreessen Horowitz, wrote about this cycle in 2020. When the price of bitcoin rises, people get excited, leading to more startups, projects, and people investing in the ecosystem. When the currency's price plummets—as it did this year, to a fraction of its 2021 peak—some of those startups disappear. But Dixon argues that the best of each cycle survives, leading to "choppy yet consistent growth" in the sector. (He declined to be interviewed for this story.)

Kirsch isn't convinced that crypto can survive a more significant downturn. "It could be that the prior crypto winters were just small events in the end because everyone involved was a true believer," he says. Now that celebrities like Matt Damon and Tom Brady have brought more people to crypto platforms, it will be harder for those startups to sustain growth. That could turn the winter into something more like an ice age.

Still, entire sectors don't usually disappear, even after a bubble bursts. Plenty of ecommerce companies shuttered after the 2000 crash, but a few of them—like Amazon—continued to grow maniacally. Now isn't the time to write off crypto altogether, but rather to see which startups evolve to find a place in the post-bubble reality, and how they do it.

These challenges won't be exclusive to crypto. The sector's struggles are just a sign that a broad swath of startups will soon be facing hard times—if they aren't already.

Readout
The world, quantified.

60

Number of Cruise autonomous vehicles that were disabled in San Francisco over a 90-minute period on June 28, when they lost contact with a server and caused traffic jams.

2.9B

The estimated number of people worldwide who have never used the internet. That's 37 percent of Earth's population.

50K

Number of images a day that DALL-E Mini generated in June. The AI tool creates nine images at a time in response to any text prompt (e.g., "Demogorgon at the DMV").

80%

China's share of the market for lithium-ion batteries. Six of the 10 biggest producers of batteries for electric cars are based in the country.

BY MEGHAN O'GIEBLYN | ILLUSTRATION BY ZELOOT

Dear Cloud Support:

"I waste way too much time on my phone and am attracted by the idea of simplifying my digital life. So I found several apps and tutorials designed to make my smartphone 'dumb,' but I've hesitated to take the plunge. Am I just trying to escape modern life?" —Dumbstruck

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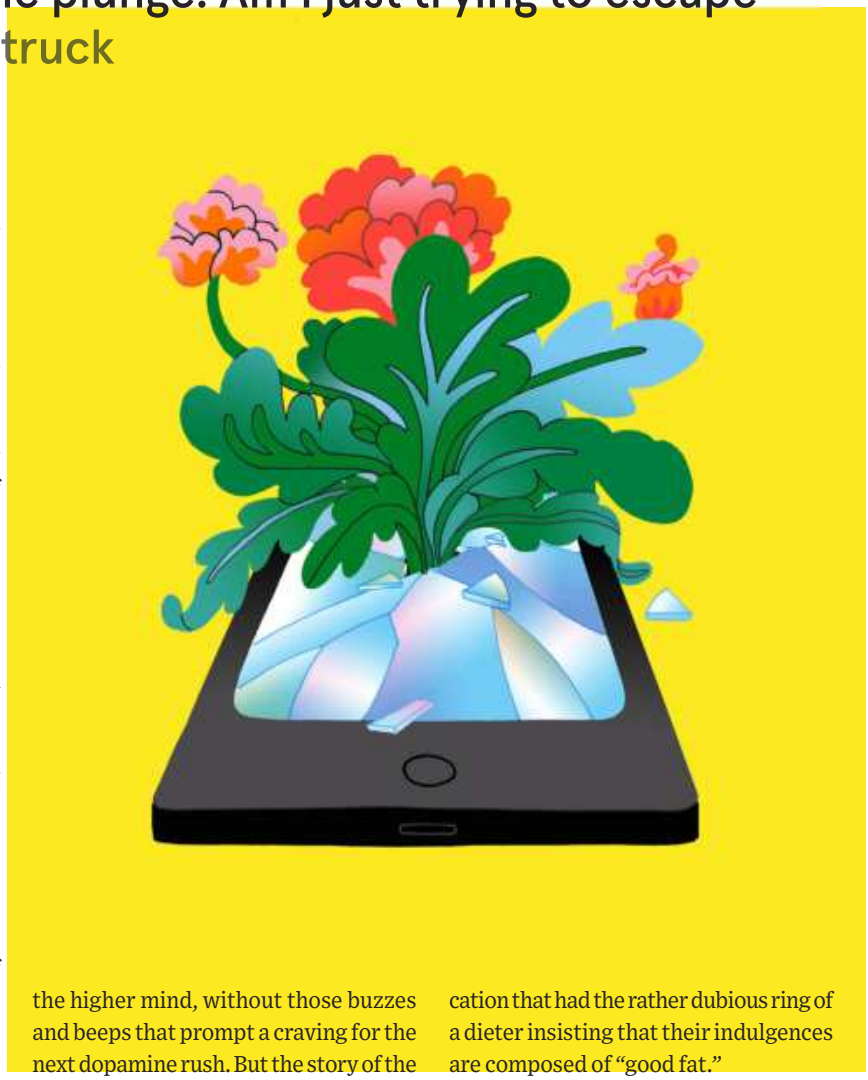

Dear Dumbstruck,

As more and more of the formerly mute objects in our lives (refrigerators, thermostats, doorbells, even toilets) are christened "smart," it often feels as though the entire inanimate world were undergoing a process of enlightenment. And "smart" is a difficult adjective to resist, particularly in a society that regards intelligence as a form of currency—or even, at times, a spiritual virtue. So while "dumbing down" one's phone ostensibly describes a rather mundane process of removing apps, blocking internet access, and choosing unappealing aesthetic features (gray scale, bland wallpaper), I understand the anxiety it can provoke. It's hard to avoid feeling that such digital minimalism is swimming against the current of this awakening, that you are not just simplifying your life but also downgrading your mind.

Perhaps that's why one of the most popular new-generation dumb phones, the Light Phone, opts for the language of luminosity and its association with intellectual brilliance. The original model, whose capacities were limited to making and receiving calls, was described in the company's 2015 Kickstarter as "thoughtfully simple" and promised a life in which users could engage more fully in cerebral and artistic tasks, the pursuits of the higher mind, without those buzzes and beeps that prompt a craving for the next dopamine rush. But the story of the Light Phone also illustrates the backsliding familiar to anyone who's attempted a digital paring down—the way features, almost on their own, creep back into the picture. By the time the second model was released, in 2019, the phone had added a (black-and-white) touchscreen and text messaging, plus music, mapping, and ride-sharing apps. The promotional materials stress that these additions are "tools not feeds," a justification that had the rather dubious ring of a dieter insisting that their indulgences are composed of "good fat."

Even the most zealous attempts to renounce ubiquitous technologies devolve into rationalization and the invention of creative loopholes. I happen to know a woman who was such an inveterate news junkie that she deleted all media apps and browsers from her phone, stripping it down to the bedrock of text, calls, weather, and maps—a solution that worked until she discovered it was possible to locate the New York

Times Company's headquarters in Manhattan on Google Maps and access the paper's homepage through the app's internal browser. The old saw about addictions—that they are impossible to outsmart—applies doubly to smart technologies, which are engineered to be used compulsively and elude your most ingenious efforts to gain mastery over them.

With that in mind, I might suggest a more counterintuitive solution: Stop fighting the fear of dumbness and instead embrace it. Like most people who want to "go dumb," I assume that you're attracted in part to the term's association with silence—the desire to dial down the chatter—but unsettled by some of its more unflattering synonyms, like idiocy. But idiocy was not always weighted by the negative associations it now carries. The word stems from the Greek *idiotes*, which referred to Athenians who were essentially laypersons—those who, unlike soldiers, scribes, and politicians, maintained little connection to the affairs of the state. It meant "on one's own" or "private" (meanings that persist in words like *idiosyncratic*) and was reserved for those who enjoyed a freedom and autonomy from public life, the kind of existence that often serves as a haven for independent thought. Gilles Deleuze argued that idiocy was intimately linked to philosophy, beginning with Socrates, who famously recognized that he "knew nothing" and claimed this made him wiser than those who believed themselves intelligent. Descartes, in order to plant modern thought on a new terrain, similarly willed himself to disown all the knowledge he'd long taken for granted.

Few of those positive connotations survive today, and yet the resurgent nostalgia for dumb technologies is often spurred by a not entirely modern desire to distance oneself from the bustle of the polis and the frenzied commerce of the agora. Perhaps this is just another way of saying that, despite the widespread celebration of smartness, many of us secretly long to know less. The notion that information at a certain scale becomes something less than informative was a truth colorfully voiced by Thoreau, whose complaints about the 19th-century news cycle read as surprisingly familiar today. When he heard that a transatlantic cable line would soon bring updates from Europe, Thoreau imagined "the first news that will leak through into the broad, flapping American ear will be that Princess Adelaide has the whooping cough." The suspicion that such "knowledge" was making him denser was partly what spurred him to abandon the city for Walden. And I sense in your question, Dumbstruck, a similar inkling that the information economy obscures, somewhere—perhaps in the fine print of its mammoth user agreements?—a bleaker existential bargain: that the instant access to knowledge has subtly atrophied your imaginative musculature; that your immersion in digital echo chambers might be foreclosing more original forms of thought.

Idiocy should not be confused with stupidity, the willful refusal of information that might disrupt one's rigid convictions. The latter is rooted in a pride that makes it the inversion of smartness, not its alternative. Idiocy might be seen as a condition of openness and flexibility, qualities that define the fool archetype that appears in many cultures, from the Sioux *heyoka*, a sacred clown who deliberately engaged in counterintuitive actions (riding a horse backward, wearing clothes inside out, complaining of being full when food is scarce) so as to challenge popular assumptions, to the Russian *yurodivy*, or holy fool, a figure whose seeming madness was believed to lend him divine insight. Fools tend to be shape-shifters who thrive at thresholds and boundaries. This was particularly true of the Shakespearean fool, who was frequently "balancing on the edge between reality and various constructions of reality," as one scholar puts it. The fool mediated the space between the play and the audience—that dimension where the virtual meets the real—moving fluidly between the stage and the crowd and occasionally breaking the fourth wall to comment on the play's themes.

I bring up the fool in part to stress the virtue of "dumbing down" as opposed to opting out. As appealing as it might be to live totally off the grid or leave civilization, it's practically impossible to emulate Thoreau's retreat to Walden (as impossible as it was even for Thoreau himself). It may well be that the dumbed-down smartphone offers a distinct advantage: Even the barest smartphones can be restored to their full capabilities at any moment, which places the user in the fool's liminal space, a no-man's-land that might offer perspective, or even wisdom. Your unwillingness to "take the plunge," as you put it, seems less a sign of fearful waffling than evidence that you long for those unique possibilities that exist somewhere between the online and off, between the virtual and the real. In the best-case scenario, the stripped-down smartphone offers neither an escape from reality nor a refusal of its conditions, but a portal into new opportunities for defining one's relationship to public life—while still being able to call an Uber.

Faithfully,
Cloud

MEGHAN O'GIEBLYN *is the author, most recently, of* God, Human, Animal, Machine.

Cloud Support: Spiritual Troubleshooting for the Digital Age. For philosophical guidance on encounters with technology, write to cloudsupport@WIRED.com.

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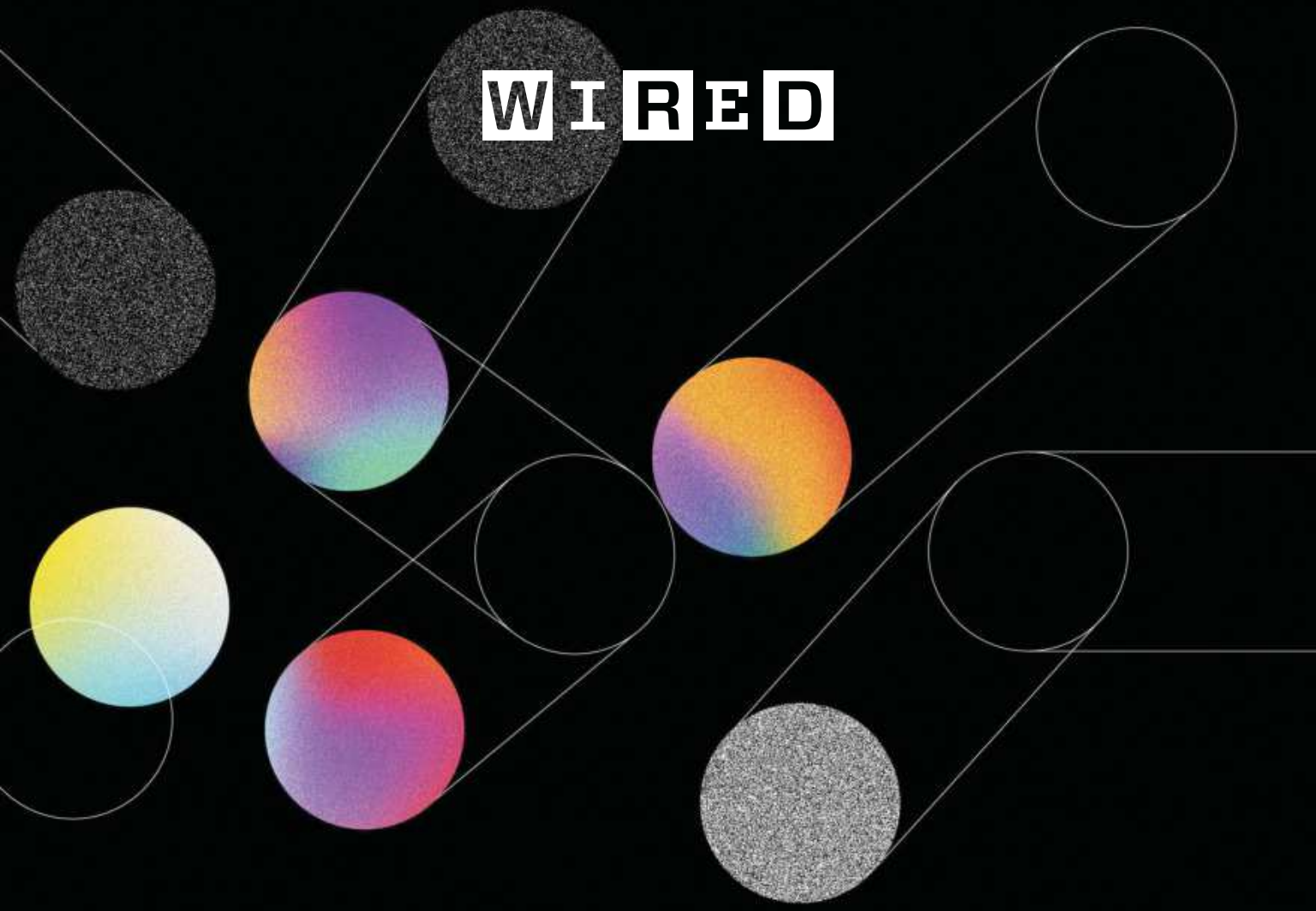

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BY THE WIRED REVIEWS TEAM | PHOTOGRAPHS BY KELSEY MCCLELLAN

WORK IT

The end of summer means heading back to the office or classroom. Whether you do so in person or remotely, the right gear will keep you happy and productive.

Poppin Organizer Caddy
If you're hot-desking, WeWorking, or art-studioing, Poppin's handy organizer lets you tote your stash of essentials from desk to desk while keeping your shared workspace tidy. The 12 compartments have ample room for pens, notebooks, markers, paint brushes, and hand sanitizer. The caddy is only about 12 inches long and 7 inches tall, so it's easy to slip into a drawer or cabinet for storage. **$28**

REI Co-Op Rainwall Kids Rain Jacket ▼
We are continually surprised by the value of REI's in-house line of rain jackets. The quality of this children's option is exceptional given its sub-$100 price. The Rainwall has plenty of premium features like zippered pockets, sealed seams, a lined collar, and a multilayer construction that blocks the wind and rain while retaining a fair amount of breathability. It uses high-quality laminate waterproofing instead of the less-expensive coating that many cheaper rain jackets rely on. Be sure to write your kid's name on the ID label inside so it doesn't disappear into the black hole of the lost and found. **$70**

Timbuk2 Closer Laptop Briefcase ▲
You want to impress when you walk through those glass doors again, so promote yourself from that ragged old messenger bag to this over-the-shoulder business-casual satchel from Timbuk2. The recycled polyester carry-all has a padded laptop sleeve (accessed via a zipper on the backside) that fits a 15-inch PC. Under the big flap you'll find a 10-liter main compartment and all the necessary appointments for chargers, pens, and your AirPods case. There's also a water bottle pocket on the side. If you prefer a classier look, unclip the shoulder strap and carry it by the grab handle at the top like a briefcase. **$159**

POC Myelin ▶
Anyone commuting by bike or escooter needs a helmet, so choose one that helps the planet while it coddles your noggin. Half of the materials in this stylish helmet are recycled, and its design uses as little plastic as possible. For example, the shell is covered by woven fabric instead of a plastic laminate. Environmentally harmful glue has been eliminated too; the protective sections snap together like a puzzle, and the recycled polyamide chin strap crisscrosses the entire helmet to keep everything together. If it cracks while protecting your brain from an impact, the whole thing can be dismantled and recycled. **$99**

Rough Enough Pencil Case ▶
If you're particular about your writing implements—"I only use dual-tipped brush pens from Japan"—then we heartily recommend packing them in a zippered pen case. This durable ripstop nylon bag, which comes in a variety of bright and fun colors, is an affordable option. It's an essential accessory for kids and adults, who can use it to hold pens and their refills, pencils and their German-made brass sharpeners, other art supplies, charging cables, earbuds, USB-C dongles, flash drives, Apple Pencils, or even makeup. Comes with a matching keychain for extra style points. **$24**

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Andria Lo

Gotrax G3

One of our top escooter picks, the G3 makes a great school commuter for students 16 and up. Its 8.5-inch tube tires do a pretty good job of absorbing bumps in the road as the 35-watt motor propels you at a top speed of 15 mph. The rear disc brake stops it fairly quickly too. A display on the handlebars shows speed and battery life. There's also a bell, a front light, a brake light, and cruise control. It has some anti-theft features like a PIN pad and a built-in lock, but we recommend a second lock for parking it outside. Larger people will get about 10 to 12 miles per charge; lighter humans will get closer to the quoted 18 miles. Just make sure they can handle folding the 36-pound frame. **$449**

Oxo Strive 16-Ounce Insulated Tumbler

We've long been fans of Oxo's travel mugs. Their lids have wide, sip-friendly openings that are easy to shut tight, they fit into just about every car or bike cup holder, and unlike most other vacuum-insulated mugs, all the pieces are dishwasher safe. The Strive, Oxo's latest, keeps your morning coffee hot enough to burn your lips until well past lunchtime. If you prefer your oat-milk lattes iced, the tumbler keeps drinks cold for 12 hours, and the hole in the lid fits most reusable straws. **$30**

JanSport Right Pack Premium

Everyone knows JanSport. The storied backpack company's ultracheap Superbreak ($36) is ubiquitous, but it doesn't offer any built-in laptop protection. We prefer the Right Pack Premium, which fits a 15-inch laptop in its dedicated, padded back pocket. The large main compartment handles the bulk of your work or school needs—notebooks, binders, planners, and a small lunch bag. The additional front pocket is generous enough to fit an iPad, with three slots for holding things like lip balm, pens, or a makeup compact. All of that stowability is elevated by a classy, adult design with a suede bottom. Nota bene: The stiff padded straps require some wearing in. **$80**

Amazon Fire HD 8 Kids Edition

Whether they're schooling at home or in person, kids need a tablet for books, educational videos, Zooms, and downtime entertainment. This compact Fire HD is our top pick for younger kids, up to age 8. The slate has an 8-inch screen; a chunky, protective case with a stand; and a battery that lasts about 12 hours between charges. It comes with a one-year subscription to Amazon Kids+, a content library filled with age-appropriate and ad-free apps, ebooks, games, and videos, including thousands of Spanish-language titles. (After that first year, it's $5 per month.) Amazon also offers "worry-free" replacement for two years, which is helpful for when your kid pushes past the limits of the protective case. For older kids, consider Apple's base-model iPad ($329), which has a superior app library and offers better creativity tools. **$140**

Samsung Smart Monitor M8
This handsome 32-inch display is one of the most full-featured options we've found for remote work or school setups. It has multiple ways to connect your PC, the built-in speakers have a fair amount of oomph, and the detachable webcam is perfect for Zooms and FaceTimes. The M8 is a bit pricier than most 4K monitors, but those other models don't run Samsung's Smart TV software. You can load it up with streaming apps from Netflix, HBO Max, and Amazon Prime Video, then use the included remote to work it like a regular TV. It's a great option for dorm rooms, studio apartments, and anywhere else an all-in-one work/play hybrid is preferable. **$730**

COURTESY OF REI, TIMBUK2, POC SPORTS, ROUGH ENOUGH, GOTRAX, JANSPORT, OXO, APPLE, FLEXISPOT, AND PANASONIC.

Humanscale Path ▲
If you don't have room for a big, luxurious chair in your WFH setup, get this small, luxurious chair instead. The Path's minimal design measures 20 inches wide and 21 inches deep, with tiny arms that don't jut out. Even better, the fully configurable chair can be ordered with no arms at all, which makes it more manageable in tight spaces and brings the price down. Each Path chair contains almost 22 pounds of recycled materials—mostly plastic bottles and ocean plastics—and among the many textile options is an "Eco Knit" material made of 100 percent postconsumer recycled polyester. It's also just super comfortable, with Humanscale's signature reclining mechanism on the back and a smoothly compressing cylinder beneath the seat. **$1,049 and up**

Apple MacBook Air ▶

Newly redesigned with updated components inside and out, the latest MacBook Air is our top Apple laptop pick for most office or school tasks, like typing, researching, Slacking, Zooming, and YouTubing. The company's newest in-house processor, the M2, makes the Air feel speedy while running everything but the heftiest applications. The battery is good for a decent eight hours between charges, and the 2.7-pound weight is nice and light for commuting. There are multiple charging options—including Apple's much-missed MagSafe system, which has been added back to the Air. **$1,199 and up.**

FlexiSpot EN1 Standing Desk ▲

We've tested a lot of motorized desks that let you move between sitting and standing over the course of the workday, and the FlexiSpot is our favorite mid-priced model. The EN1's work surface can be adjusted to any height between 28 and 48 inches. You can also save three presets for quick switching, so it's a good choice for shared offices. Once in position, it doesn't wobble like many budget models. The top is made from environmentally friendly chipboard, but it doesn't feel cheap. (Solid wood is an upgrade option too, starting at $70.) Just be aware that the desk takes some time to put together, since the instructions are a bit vague. **$300**

◀ Technics EAH-A800

A good pair of wireless, noise-canceling headphones is essential for maintaining mental focus in college dorms, home offices, and office offices. These new cans from Technics sound excellent, thanks to the 40-mm dynamic drivers and support for high-res audio over Bluetooth. The battery life is stellar too. As long as you're not absolutely pumping the volume, the headphones should last between 30 hours (playing high-res files with noise canceling on) and 60 hours (playing regular files with noise canceling off). Touch controls on the right ear cup let you invite the sounds of the outside world into your aural bubble. **$348**

OmieBox ▶

Send your kids off to school with a wide range of homemade lunch options using this smartly designed bento box. The 8.5-ounce thermos keeps hot food hot, and the insulated food-safe plastic main compartment keeps cold stuff cold. The pieces pop out for easy cleaning. Different configurations offer plenty of room for soup or a hot entrée, a sandwich, veggies, and something sweet. The colorful design is adorable without being cutesy, so it'll work for older kids too. **$45**

Contributing reviewers: Michael Calore, Julian Chokkattu, Scott Gilbertson, Medea Giordano, Simon Lucas, Joe Ray, Adrienne So, and Brenda Stolyar.
For more reviews and buying guides, visit WIRED.com/gear.

WRITTEN AND ILLUSTRATED BY RANDALL MUNROE | PATTERNS BY ABBR. PROJECTS

ASK AN ABSURD QUESTION ...

An exclusive excerpt from Randall Monroe's *What If? 2*.

WHAT DOES A STAR SMELL LIKE? What's the tensile strength of snow? How much actual dinosaur does a toy dinosaur contain? If you drove a car to the edge of the universe, how much gas would you use? What's the market value of a shoebox full of LSD? Are all the churches in the world big enough to hold all the bananas? ¶ "I like ridiculous questions, because nobody is expected to know the answer," Randall Munroe writes in the introduction to *What If? 2*, his second book of serious answers to hypothetical questions sent in by fans. You may know Munroe as the creator of the web comic *xkcd*, which offers wry commentary (usually involving stick figures wearing various hats) on science, technology, history, politics, and the daily micro- and macro-follies of human life. There's a sincerity about his projects, a nerdy excitement that reminds you of talking to a 10-year-old—assuming you know a 10-year-old who can explain what a naked singularity is and why theoretical physicists hate them. ¶ Nerdy-kid excitement is what WIRED is all about. The following pages contain Munroe's answers to two questions: What if some of outer space turned to soup? And what if you tried to swallow a cloud?

From What If? 2, by Randall Munroe.
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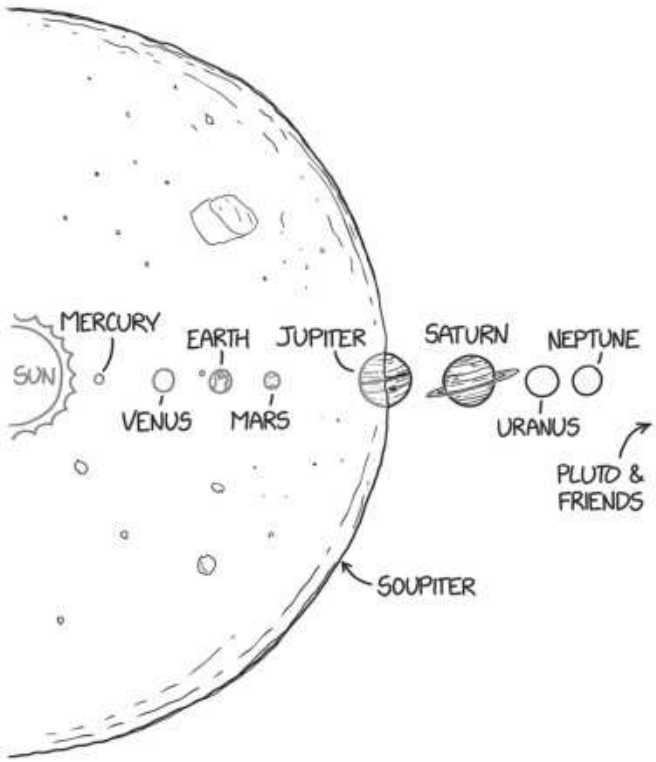
PART ONE

SOUPITER

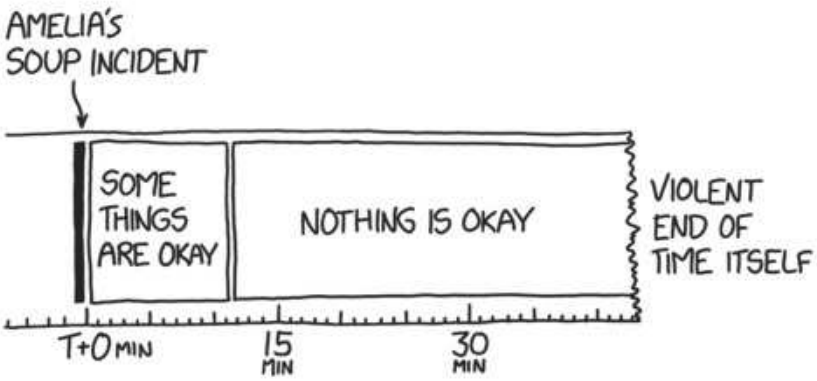
What would happen if the solar system was filled with soup out to Jupiter?

—Amelia, age 5

Please make sure everyone is safely out of the solar system before you fill it with soup.

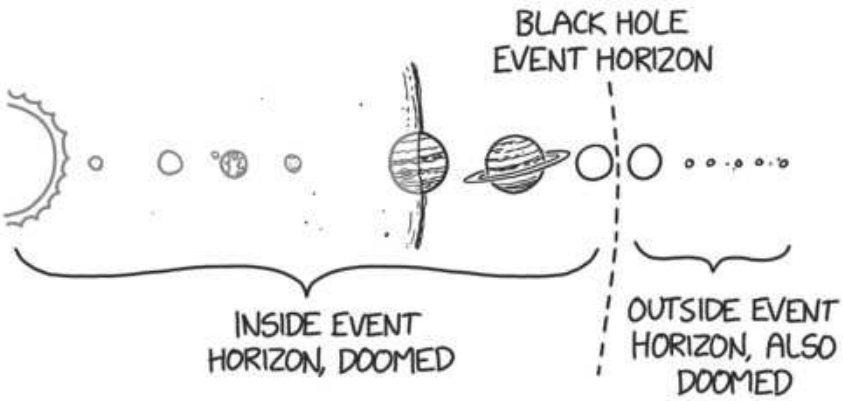


IF THE SOLAR system were full of soup out to Jupiter, things might be okay for some people for a few minutes. Then, for the next half hour, things would definitely not be okay for anyone. After that, time as we know it would end.



Filling the solar system would take about 2×10^{39} liters of soup. If the soup is tomato, that works out to about 10^{42} calories' worth, more energy than the sun has put out over its entire lifetime.

The soup would be so heavy that nothing would be able to escape its enormous gravitational pull; it would be a black hole. The event horizon of the black hole, the region where the pull is too strong for light to escape, would extend to the orbit of Uranus. Pluto would be outside the event horizon at first, but that doesn't mean it would escape. It would just have a chance to broadcast out a radio message before being vacuumed up.



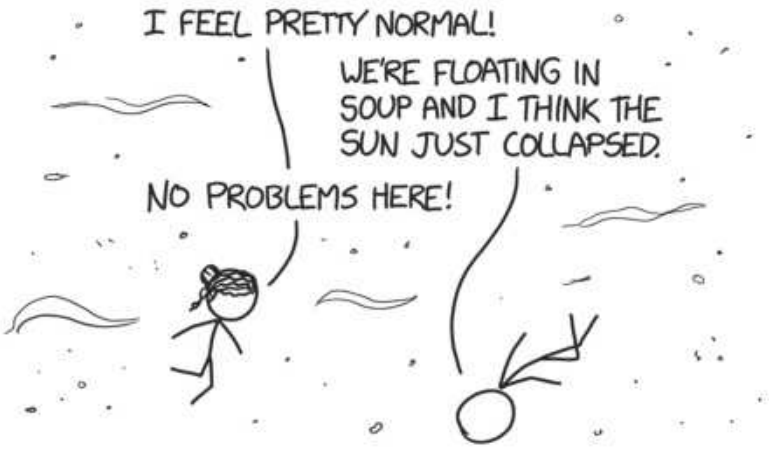
What would the soup look like from inside?

You wouldn't want to stand on the surface of Earth. Even if we assume the soup is rotating in sync with the planets in the solar system, with little whirlpools surrounding each planet so the soup is stationary where it touches their surfaces, the pressure due to Earth's gravity would crush anyone on the planet within seconds. Earth's gravity may not be as strong as a black hole's, but it's more than enough to pull an ocean of soup down hard enough to squish you. After all, the pressure of our regular water oceans under Earth's gravity can do that, and Amelia's soup is a lot deeper than the ocean.

If you were floating between the planets, away from Earth's gravity, you'd actually be okay for a little while, which is kind of weird. Even if the soup didn't kill you, you'd still be inside a black hole. Shouldn't you die instantly from ... something?

Strangely enough, no! Normally, when you get close to a black hole, tidal forces tear you apart. But tidal forces are weaker for larger black holes, and the Jupiter Soup black hole would be about 1/500 the mass of the Milky Way. That's a monster even by astronomical standards—it would be comparable in size to some of the largest known black holes. Amelia's souper-massive black hole would be large enough that the different parts of your body would experience about the same pull, so you wouldn't be able to feel any tidal forces at first.

Even though you wouldn't be able to feel the soup's gravitational pull, it would still accelerate you, and you would immediately begin to plunge toward the center. After a second had passed, you'd have fallen 20 kilometers and you'd be traveling at 40 kilometers per second, faster than most spacecraft. But since the soup would be falling along with you, you'd feel like nothing was wrong.

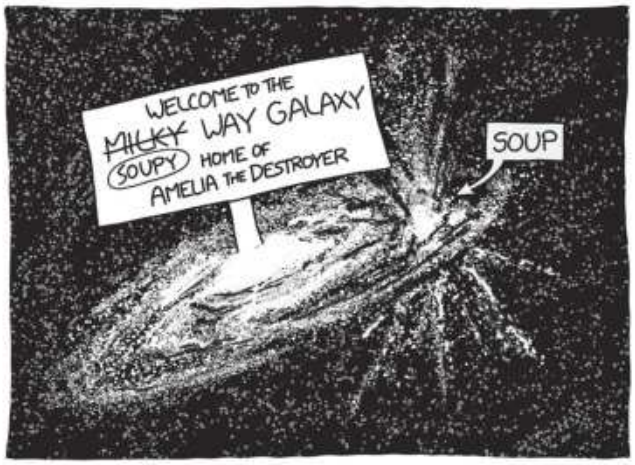


As the soup collapsed inward toward the center of the solar system, its molecules would be squeezed closer together and the pressure would rise. It would take a few minutes for this pressure to build up to levels that would crush you. If you were in some kind of a soup bathyscaphe, the pressure vessels that people use to visit deep ocean trenches, you could conceivably last a little longer.

There would be nothing you could do to escape the soup. Everything inside it would flow inward toward the singularity. In the regular universe, we're all dragged forward through time with no way to stop or back up. Inside a black hole's event horizon, in a sense, time stops flowing forward and starts flowing inward. All time lines converge toward the center.

From the point of view of an unlucky observer inside our black hole, it would take about half an hour for the soup and everything in it to fall to the center. After that, our definition of time—and our understanding of physics in general—breaks down.

Outside the soup, time would continue passing and problems would keep happening. The black hole of soup would start slurping up the rest of the solar system, starting with Pluto almost immediately, and the Kuiper belt shortly thereafter. Over the course of the next few million years, the black hole would cut a large swath through the Milky Way, gobbling up stars and scattering more in all directions.

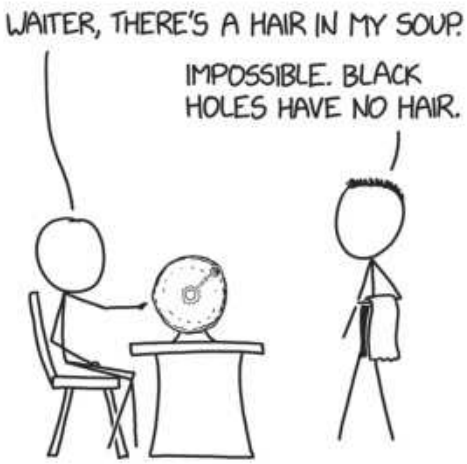


This leaves us with one more question: What kind of soup is this, anyway?

If Amelia fills the solar system with broth, and there are planets floating in it, is it planet soup? If there are already noodles in the soup, does it become planet-and-noodle soup, or are the planets more like croutons? If you make a noodle soup, then someone sprinkles some rocks and dirt in it, is it really noodle-and-dirt soup, or is it just noodle soup that got dirty? Does the presence of the sun make this star soup?

The internet loves arguing about soup categorization. Luckily, physics can settle the debate in this particular case. It's believed that black holes don't retain the characteristics of the matter that goes into them. Physicists call this the "no-hair theorem," because it says that black holes don't have any distinguishing traits or defining characteristics. Other than a handful of simple variables like mass, spin, and electric charge, all black holes are identical.

In other words, it doesn't matter what kind of ingredients you put into a black hole soup. The recipe always turns out the same in the end.



PART TWO

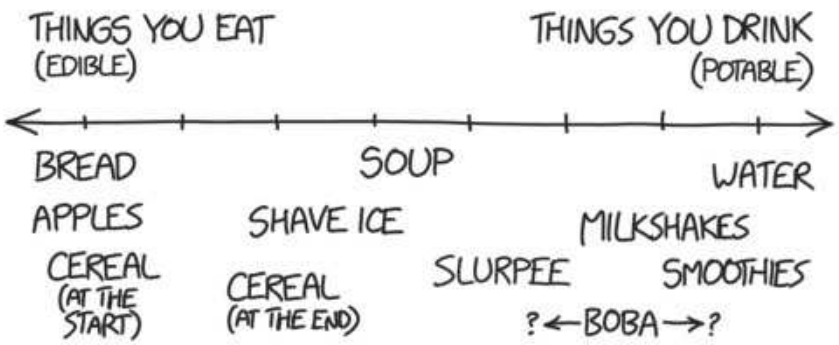
EAT A CLOUD

Could a person eat a whole cloud?

—Tak

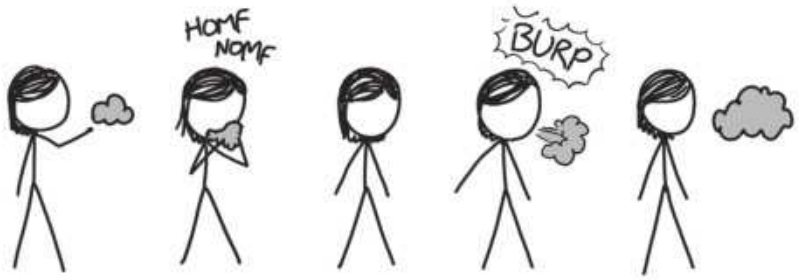
No, unless you're allowed to squeeze the air out first.

CLOUDS ARE MADE of water, which is edible. Or drinkable, I guess. Potable? I've never been sure where the line between eating and drinking is.



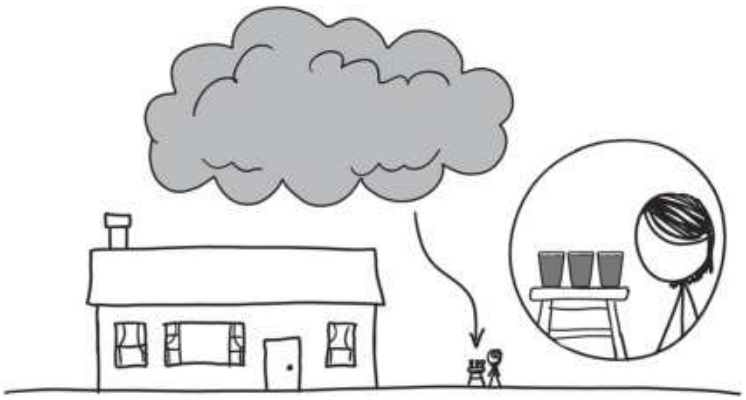
Clouds also contain air. We don't usually count air as part of food, since it escapes from your mouth as you chew or—in some cases—soon after you swallow.

You can certainly put a piece of a cloud in your mouth and swallow the water it contains. The problem is that you'll need to let the air escape—but air that's been inside your body will have absorbed a lot of moisture. When it leaves your mouth, it will carry that moisture with it, and once it encounters the cool, cloudy air, it will condense. In other words, if you try to eat a cloud, you'll just burp out more cloud faster than you can eat it.



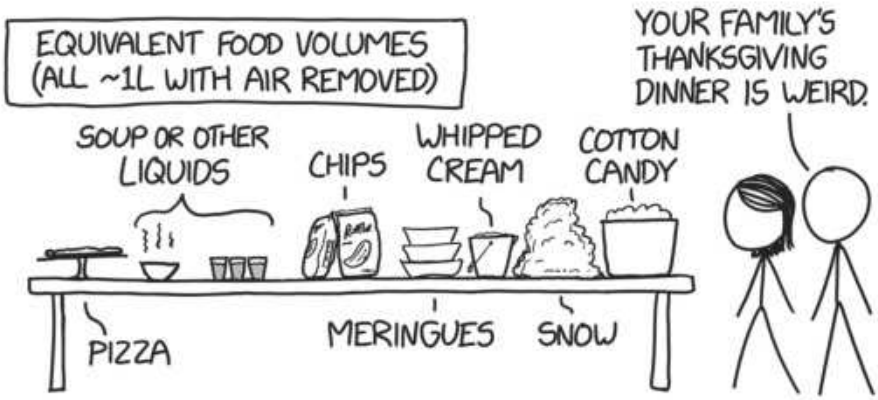
But if you can collect the droplets together—perhaps by passing the cloud through a fine mesh and squeezing it out, or ionizing the droplets and collecting them on charged wires—you could absolutely eat a small cloud.

A fluffy cumulus cloud the size of a house could contain about a liter of liquid water, or two or three large glasses, which is about the volume a human stomach can comfortably hold at one time. You couldn't eat a huge cloud, but you could absolutely eat one of those small house-size ones that briefly block the sun for a second or two when they pass overhead.



A cloud is just about the largest thing you could eat in one sitting. There aren't a lot of things puffier and lower-density. Whipped cream seems pretty fluffy, but I'm told it's 15 percent as dense as water,* so a gallon of whipped cream would weigh about a pound. Even accounting for all the air that would escape, you couldn't eat more than a small bucket of it. Cotton candy, one of the most cloudlike foods, has a very low density—about 5 percent that of water—which means that you could in theory eat about a cubic foot of it in one sitting. That wouldn't necessarily be healthy, but it would be possible. But even if you spent your entire life eating cotton candy, you'd probably die before you ate enough to fill a house.

Other extremely lightweight edible substances include snow, meringues, and bags of potato chips, but you probably couldn't eat a cubic foot of any of them in a single sitting.

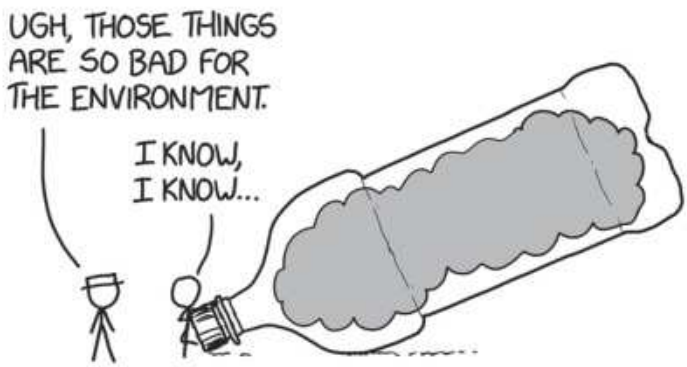


So if you want to eat a cloud, you'll need to do some work, but if you succeed, you'll have the satisfaction of knowing that you've eaten the largest thing you can possibly eat.

* Citation: Tracy V. Wilson, host of the podcast *Stuff You Missed in History Class*, who happened to have a cooking scale and a can of whipped cream on hand when I got this question.

A CLOUD
NUTRITION FACTS
SERVING SIZE: 1 CLOUD
SERVINGS PER SKY: COUNTLESS
TOTAL CALORIES: 0
% DAILY VALUE*
TOTAL FAT: 0g 0%
SATURATED FAT: 0g 0%
TRANS FAT: 0g 0%
CHOLESTEROL: 0g 0%
SODIUM: 0g 0%
TOTAL CARBOHYDRATES: 0g 0%
DIETARY FIBER: 0g 0%
SUGAR: 0g 0%
PROTEIN: SOMETIMES A FEW BUGS
CALCIUM: 0% IRON: 0%*
MAGNESIUM: 0% ZINC: 0%
*IRON VALUE MAY BE HIGHER IF YOU LIVE DOWNWIND FROM THE HOUSE FROM CHAPTER 4

Just remember to store your cloud in a reusable bottle. There's no need to waste all that plastic!



RANDALL MUNROE *(@xkcd) is the author of the forthcoming book* What If? 2 *and the* New York Times *best sellers* How To, What If?, *and* Thing Explainer.

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THE LOBBYIST NEXT DOOR

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WHAT DO A REAL HOUSEWIFE, AN OLYMPIC ATHLETE, A PHYSICAL THERAPIST, A DOULA, AND A NASCAR DRIVER HAVE IN COMMON?

THEY'RE ALL BEING PAID BY A NEW BELTWAY AD-TECH STARTUP AS INFLUENCERS—PEDDLING NOT PRODUCTS BUT IDEOLOGIES.

AT FIRST GLANCE, the posts appeared to have nothing in common. A Philadelphia-area attorney who proffers financial advice urged her 1,700 Twitter followers to sign up for a credit union. A 23-year-old climate activist in Texas rallied her 49,000 fans on TikTok and Instagram to join a mailing list promoting Democrats in statewide offices. A physical therapist for the elderly in Florida prodded her 3,900 Instagram followers to sign a petition demanding that Congress pass paid medical leave, sharing the story of her grandmother's battle with dementia. Each of these posts was funded by a well-heeled advocacy organization: the Credit Union National Association, the Democratic Association of Secretaries of State, and UsAgainstAlzheimer's Action.

Even though none of the people reading these posts knew it, however, they were all made possible by the same company: Urban Legend, a small ad-tech startup operating out of a loft in Alexandria, Virginia.

Launched in 2020 by a pair of former Trump administration staffers, Urban Legend pledges on its website to "help brands run accountable and impactful influencer campaigns." Its more comprehensive mission, one rarely articulated in public, is slightly more ambitious.

Staffed by a plucky 14-person team, Urban Legend keeps its largest asset carefully hidden away inside its servers: an army of 700 social media influencers who command varying degrees of allegiance from audiences that collectively number in the tens of millions. The company has painstakingly cultivated this roster to reflect every conceivable niche of society reflected on the internet: makeup artists, Nascar drivers, home improvement gurus, teachers, doulas, *Real Housewives* stars, mommy bloggers, NFL quarterbacks, Olympians, and the occasional Fox News pundit.

These influencers are paired with clients on Urban Legend's private platform, the Exchange, where buyers spell out the parameters of the message they want to push to the public and set a budget. Influencers snatch the best available offers from a menu and are then free to craft the campaign's message, molding it to the rhythms and vernacular of their followers. Clients only pay for each "conversion" an influencer nets—$1.25, say, for every follower who joins a newsletter. In two years, Urban Legend's influencers have run more than 400 campaigns, connecting people to its clients millions of times. Henri Makembe, a veteran Democratic campaign strategist in Washington who has worked with Urban Legend several times, compared the concept to "unboxing" videos—when an influencer unwraps and showcases a product sent to them by a brand. Such product influencers are a $15 billion marketing industry. "Now we're realizing, 'Oh: We can do that with an idea,'" Makembe says.

This model is the brainchild of Urban Legend's 35-year-old founder and CEO, Ory Rinat. Rinat spent the early part of his career working in Washington's media circles before becoming director of digital strategy for the Trump White House. The idea for Urban Legend arose from many currents in American public life, including "the rise of influencer marketing, the increase in trust in those people, and also the rise of individuals to be their own media brand," he says. In both retail and influencer politics, he says, small is big: "Our creators range from 3,000 to 14 million followers," Rinat tells me, but the majority are "micro-influencers" (those with 100,000 or fewer followers) and "nano-influencers" (fewer than 10,000).

Like baseball, selling influence is a pastime that rarely gets reinvented. There are only so many ways to get a person to do the thing you want. In politics, the more solicitous methods include robocalls and email spam with increasingly audacious subject lines ("Hey, it's Barack"). "The most impactful messaging strategies have always been the most personalized," says Anat Shenker-Osorio, a progressive campaign consultant based in California. Peer-to-peer outreach has long proven the most effective at persuading or mobilizing—appeals that create "the feeling like this is a real *person* talking to me." Urban Legend's approach reflects this insight, embracing influencers less as celebrity spokespeople than as peers for hire. If an influencer's financial advice helped you save for a vacation or their fashion tips earned you compliments, maybe their view on the minimum wage, or critical race theory, is worth considering too. "To then have that person give you information about politics? That's potentially an incredibly potent and powerful messenger," says Shenker-Osorio.

But the rise of this new messenger has disquieted some. For one, it's unclear whether influencers are following federal disclosure rules. And as at similar firms, the names of Urban Legend's influencers and clients are a closely held secret—or were, until recently—creating the prospect of an internet flush with untraceable money, in which Americans can no longer tell an earnest opinion from a paid one. Initially, Rinat told me that the firm's clients included a Fortune 50 tech company, a "major labor union," an "environmental advocacy group," and one "LGBTQ+ advocacy group."

In Washington, there's been a swell of interest in the influencer business, across the political spectrum. It bears the signs of an incipient arms race, much like the advent of super PACs a decade ago. Hany Farid, a professor of computer science at UC Berkeley who has briefed the Biden administration on social media regulation, predicted that Urban Legend's model will be recapitulated widely before the 2024 presidential election. "This is the future," Farid told me.

Tellingly, both Urban Legend's boosters and its detractors agree on the presence of a black hole at the center of the internet that's pulled society into alignment with its goals. "To understand what Urban Legend is doing, you have to look at where we are as a society," says Makembe. "There's a lack of trust"—in institutions, in media, in each other—a worsening problem that he says Urban Legend is solving. Others are less sanguine. "You're getting paid to manipulate your followers," Farid says flatly. "Somebody with 3,000 followers is now, essentially, a lobbyist."

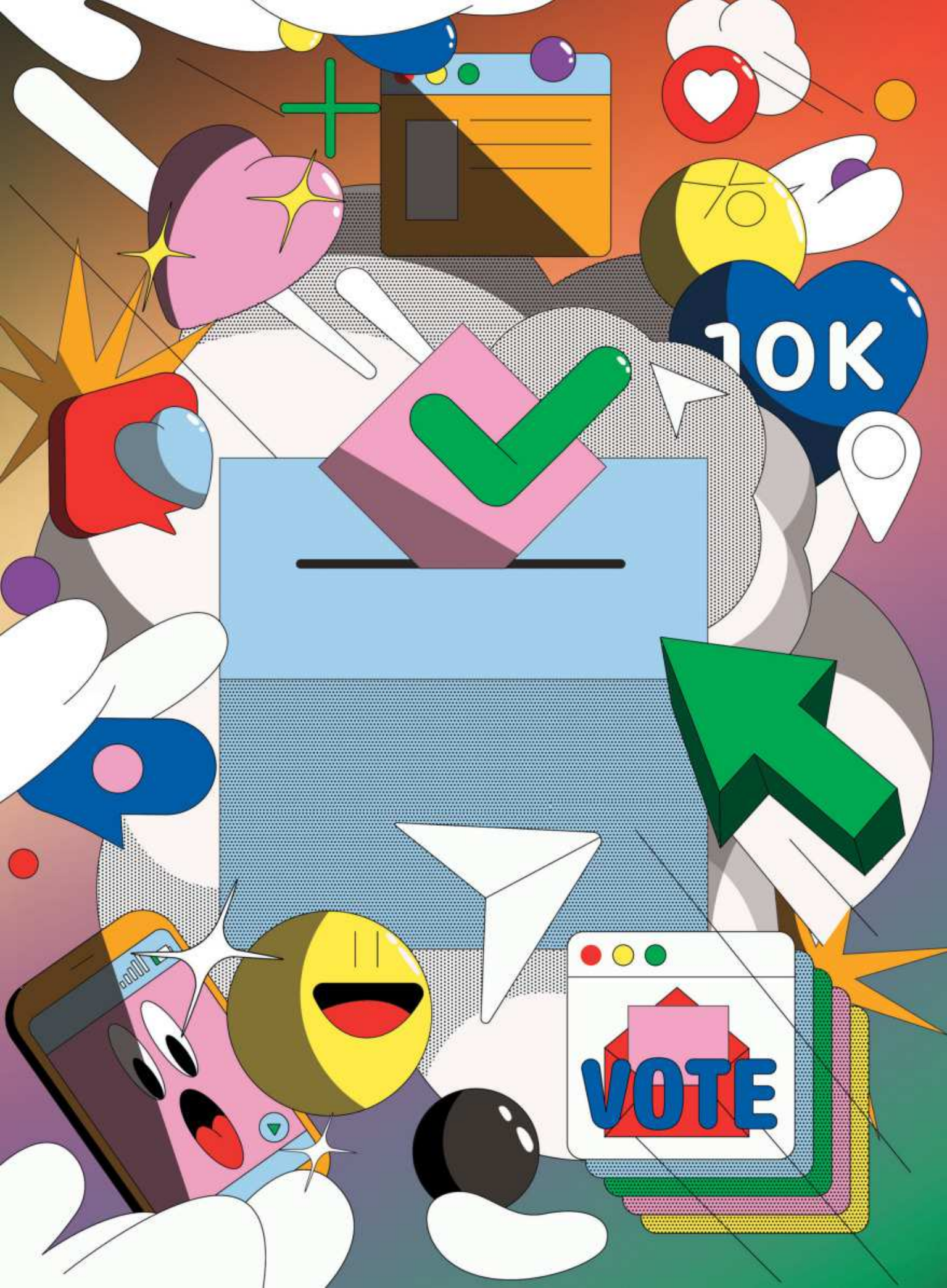
RAISED IN QUEENS, New York, Rinat launched his first business at age 10. He pasted together several mail-order catalogs from rival home goods sellers and then enlisted preteen influencers—his elementary school peers—to peddle them to their parents. Young Ory managed the orders and took a cut of the sales ("a couple hundred dollars," he estimates). The concept is not so different from Urban Legend, knitting sellers together within one convenient ecosystem.

After graduating from Columbia University in 2009 with a degree in political science and history, Rinat moved to Washington, DC. He attended the night program at Georgetown's law school while working on the business team of Atlantic Media, the parent company of magazines like *The Atlantic* and *National Journal*. Rinat and his colleagues were experimenting with how to keep magazines profitable after the internet had torpedoed their ad revenues. His team became a pioneer of sponsored content, consulting with big-name companies to create multimedia versions of magazine-style stories.

From a business perspective, however, Rinat found aspects of this model to be a bad deal for corporate clients. It had what he calls an "authenticity problem," in that few people raced to read an "article" written by suits at Exxon. There was also an "accountability problem." Corporate advertisers paid one lump sum up front, then simply hoped people would see their ad. Rinat recalled one DC trade association that paid a marketing agency $300,000 to place ads on Facebook urging users to email their congressperson. In the end, the group netted 600 emails—$500 per email.

Rinat speaks the savvy language of internet marketing; in layman's vocabulary, "accountability" means "getting clients their money's worth," and "authenticity" means "making people believe your message is genuine, even though someone paid for it." Nevertheless, Rinat sensed these challenges had implications beyond journalism. Around Washington, he began asking strange questions—such as the price corporate buyers were willing to pay for, say, a citizen's heartfelt letter to Congress. (One client's answer: $48). He wondered whether some new development would bridge these problems. "What was left," he reasoned, was "finding the mechanism."

Rinat kept these ideas alive when he began directing digital strategy for the


10K
VOTE

conservative Heritage Foundation in 2015. After Trump's election, Rinat took an appointment in the State Department for a program combating violent extremism and terrorism online. Two weeks into the job, the incoming White House director of digital strategy reportedly failed an FBI background check, and Rinat was appointed interim director. Eventually, he stayed on. From his office in the Eisenhower Building, he helped redesign the White House website, build a web portal for the response to the opioid crisis, and launch Coronavirus.gov.

By then, social media influencers had gained a tighter grip on politics, particularly in Trump's brand of movement conservatism. Rinat explored ways to unlock their power. In 2019, alongside Sondra Clark, the administration's director of marketing and campaigns, Rinat helped organize the first White House Social Media Summit. At the event, Trump gathered in the East Room with about 200 online "digital leaders" in conservative politics—activists and rabble-rousers including Project Veritas founder James O'Keefe, Turning Point USA's Charlie Kirk, and Bill Mitchell, a spreader of the then incipient QAnon conspiracy. "The crap you think of," Trump told the crowd, "is unbelievable." The event, according to an administration official who attended, was in keeping with a larger strategy in which social media mavens were given "an exclusive-access look at what the administration was doing, and then reaping the benefits" as they posted enthusiastically about their time at the White House. "Sondra and Ory," the person continued, "were really the architects of that."

Influencers had become "the mechanism" Rinat was searching for—the ultimate gig labor force, capable of delivering what he called "cost-per-action marketing, with client-set rates." He began floating his business idea to mentors. (One was Atlantic Media chair David Bradley.) In June 2020, Rinat left the White House. Less than a month later he launched Urban Legend, and Clark came on board as president. One of their first clients was their former boss. In the second half of 2020, according to the Federal Election Commission, the Trump campaign paid Rinat's firm more than $1 million for "online advertising."

RINAT WAS UNSPOOLING this history from the corner of Urban Legend's brick-and-cedar office when I visited on a warm morning this past spring. The firm occupies the top floor of a townhouse in Alexandria's colonial-style downtown, wedged between a boutique pizzeria and a clothing store. By turns charming and withdrawn, Rinat has a clean-shaven head and a taciturn, solemn air, except for amused eyes that turn up cheerily at the corners when he is considering some proposition. "The technology we're talking about is not revolutionary," he clarifies at the outset. "We just integrated it."

He led me into the team's small conference room, which had chic-ish furniture and a small library. (Books included *Confrontational Politics*, by a gun-rights activist, and *Rules for Revolutionaries*, by two Bernie Sanders consultants.) Hanging on the wall was a large television monitor, where Rinat spun through a tour of the Exchange, using me as a hypothetical influencer (or "creator," as he prefers). We set up my creator account, then clicked on a tab labeled "My Campaigns." On prim, eggshell-colored menu panes, I was presented with campaigns from a series of eager advertisers. One dummy client, called Shipmates, was a sustainable packaging company that wanted my followers to sign up for its newsletter. The company offered me $1.90 as the "revenue per conversion," with a limit of 3,000 sign-ups. I checked a box, agreeing to the terms and conditions, and clicked "Join Campaign."

Now I was officially influencing for cash. Shipmates offered me a "campaign brief"—suggesting rhetoric for getting my followers to "join our sustainability conversation." But how I crafted this appeal was up to me. I was given a menu of custom links, each traceable just to me, and each designated to a different platform: Twitter, Instagram, Facebook, YouTube. Rinat had an employee click one of my links, sending their browser to Shipmates' newsletter page, where they promptly signed up. On my dashboard, a ticker labeled "Your Conversions" flipped from 0 to 1. "And look at that," Rinat said gamely. "You just made a dollar ninety." Among other tricks, Urban Legend can also track visits to an advertiser's website, books on Amazon, op-eds in *The New York Times*, and form emails to Congress.

At a cramped desk a few feet away sat Sophia Schreiber, a 26-year-old "creator success coordinator." Schreiber scours the internet for social media personas who have a loyal following and post in areas

> HERE'S THE IRONY OF THIS WHOLE THING. URBAN LEGEND IS RELYING ON PRECISELY THE SAME THING"—TRUST—"THAT IT IS ARGUABLY DESTROYING."

that advertisers might want to reach. (Fast-growing verticals are parenting and wellness—and, lately, cryptocurrency educators, Rinat says.) Sitting inside a white-paneled phone booth was James Hong, the company's 30-year-old vice president. After Schreiber flags the influencers, Urban Legend staff call them to vet their demeanor and professionalism—and to suss out any untapped advertising potential. Urban Legend's influencers "are incredibly multifaceted," Rinat explains. "We might be onboarding a blogger who has cooking tips" but come to learn they also care about climate change or religion—"issues they're passionate about, but not always posting about," Rinat says.

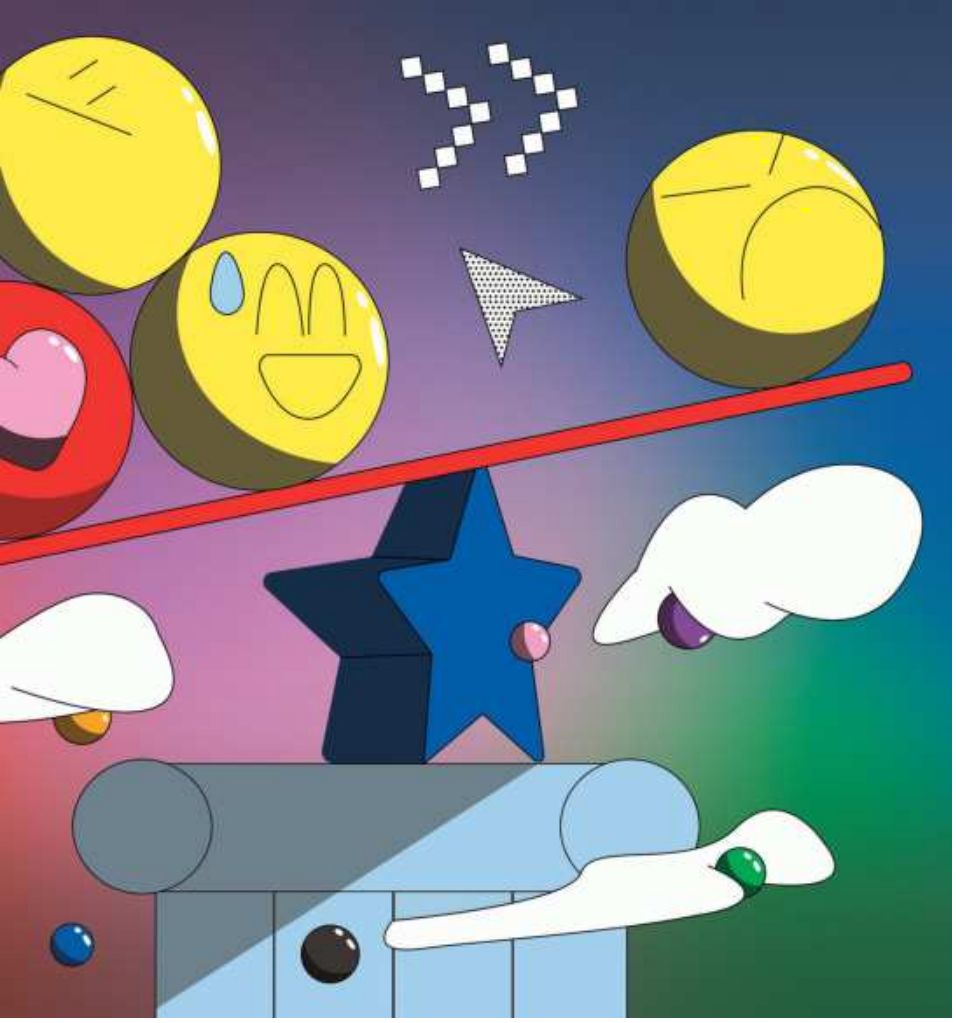
After a team lunch, Urban Legend's president, Sondra Clark, joined us at the conference table and explained the delicate art of influencer management. Chosen influencers are classified within a large, meticulously maintained database. To an extent, Urban Legend can curate the messengers for its corporate clients by sending push notifications that nudge them toward campaigns based on the creators' profile of causes. Set against Rinat's more austere mode, Clark seemed congenitally sunny, exuding a breezy charm. She framed the Exchange as empowering for influencers. "'*I want to talk about human trafficking,*'" she says, mimicking an influencer. "That's awesome! And they get a text from us—hey, there's a campaign in your account on this issue."

In conversation, Rinat and Clark like to emphasize causes with a liberal bent, like climate change, or no bent, like Alzheimer's awareness, but they left their more conservative campaigns a mystery. When our conversation neared the subject of partisan influence on the Exchange, Rinat evinced a tactful froideur. His vision for the platform was one that can "work with everybody," he said, somewhat elliptically. Urban Legend's staff is almost evenly split between Democrats and Republicans, he said, and most come from the world of marketing. "When you're talking about hospital price transparency or prenatal health care or Alzheimer's, it's not left-right. It's beyond politics," Rinat said.

It would all become clear, supposedly, when I met Rinat's selected influencers. One was Zahra Biabani, the 23-year-old creator behind the Instagram and TikTok accounts Soulful Seeds, who was recruited by Urban Legend last fall. "I didn't know that you could be paid for sharing a petition!" she says, laughing. Biabani has around 30,000 followers on Instagram and 19,000 on TikTok and posts what she calls "climate optimism"—sharing motivating news about climate change, occasionally while grooving to a pop soundtrack. (Instagram's official account, with 500 million followers, featured one of her dances on Earth Day.) From Biabani's point of view, Urban Legend wasn't asking her to do anything unusual. "You could get paid for promoting things that I would already promote," she says. To her, the Exchange "is a very low-effort and noncontroversial way of leveraging the values-aligned audience that I built as an influencer."

Leah O'Rourke, a 31-year-old physical therapist for older adults, posts geriatric care advice on her Instagram account, Love to Care For. "I guess I'm an influencer, which feels weird to say," she says. With 3,900 followers, O'Rourke estimates she made about $500 last year on the Exchange, posting for four campaigns. She seized on one about Alzheimer's, telling followers how dementia had tormented her grandmother and urging them to sign a petition asking Congress to fund paid medical leave for elder care. Then there was LaRese Purnell, a tax accountant from Ohio who has built his brand advising Black families (and recently, several NFL athletes) about financial planning. Purnell—who sits on multiple nonprofit boards, owns a small restaurant chain, and has hosted a Friday morning radio show in Cleveland—estimates that he has about 100,000 followers across various platforms. Staff from Urban Legend "directed me into campaigns that fit my image," Purnell says. He shot a few videos talking about the benefits of credit unions while walking his dog. "If I told people in this community, 'These are the best shoestrings to put in your shoes,' they would believe me," says Purnell, who sensed the cleverness in Urban Legend's business model. "Because I build trust."

Clients who purchased these ads are generally pleased. Rinat introduced me to two. Chris Lorence, a veteran marketing executive who



placed the credit union ad, said the users who came from Purnell and other influencers were 11 times more likely to take action than their typical traffic. Another client, Sean Clifford, runs a technology company called Canopy that blocks pornography from family devices. To Clifford's surprise, Canopy's campaign attracted a wide array of spokespeople, and the Exchange "brought new influencers to the table that I *never* would have dreamed of approaching." One was a firebrand political commentator in his twenties—"very political, very controversial," is all Clifford would say—while others were news media personalities who attract large followings on Instagram and TikTok.

Clifford, who attended the great books program at St. John's University, says Urban Legend's model—while undeniably effective—raised deeper questions. He cited Plato's ancient dialog *Phaedrus*, in which two gods, Thamus and Theuth, argue fiercely about the invention of writing. Far from enhancing truth, Thamus warned, humanity's "trust in writings" by outsiders would degrade their critical faculties.

Before the afternoon at Urban Legend headquarters ended, Rinat convened an all-hands meeting to discuss the Exchange's forthcoming mobile app—for when influencers have a "sitting-at-a-red-light moment," Rinat explains. Throughout the day, the most salient refrains were words like "authentic" and "trust"—a reminder, if nothing else, of what Urban Legend is really selling. Rinat situated the company along a spectrum of persuasion. "What's the highest possible thing on that spectrum? It's probably a one-to-one communication—somebody you trust," he says. "We're just below that." This is why it was key, Clark explains, that influencers craft the message. The Exchange, she says, "lets the creators' voices sing."

LAST SUMMER, then White House press secretary Jen Psaki filmed a series of clips with TikTok star Benny Drama to tout the coronavirus vaccine. Earlier this year, Biden administration officials gave a special briefing on the war in Ukraine to 30 TikTok influencers. And when Congress was advancing an antitrust bill to regulate Amazon, Google, and Apple, *The Washington Post* reported that activist groups and their Big Tech opponents each hired TikTok personalities to duke it out with a flurry of videos—some supporting the "historic bipartisan legislation to #ReinInBigTech," others decrying the proposal as "dumb and bad economically."

Washington's political power brokers are quietly inching toward a full embrace of influencers. If not handled with care, however, that can be hazardous—particularly when the arrangement is unmasked. During the Democratic presidential primary of 2020, BuzzFeed News reported that a super PAC for Senator Cory Booker had tried to entice influencers with cash, giving Booker an aura of desperation. Later in the race, Mike Bloomberg found himself in trouble when a surge of meme creators began aggressively pushing his candidacy—but some left it unclear whether the posts, which garnered $150 a pop, had been sponsored.

The Federal Trade Commission requires people to disclose if they've been paid to endorse something online, using terms like "#Ad" or "Sponsored." Around the time of the Bloomberg revelation, Rohit Chopra, an FTC commissioner, issued a statement clarifying that "paying an influencer to pretend that their endorsement or review is untainted by a financial relationship" is "illegal payola." (Although one brand has been penalized by the FTC for misleading influencer marketing, no influencer, broker, or platform has yet faced penalties for failure to disclose.)

Urban Legend's approach to disclosure is, effectively, the honor system. Formally, influencers are required to make disclosures when they agree to the terms and conditions, and they are reminded during

their onboarding. But Rinat doesn't enforce the provision; that's the FTC's job, he says. "We do our due diligence, and then it really is their responsibility."

Researchers who spoke to WIRED found this posture unconvincing. "Relying on financially motivated influencers to be ethical is naive," says Renée DiResta, who studies narrative manipulation at the Stanford Internet Observatory. She called influencer disclosure "yet another area in which law hasn't caught up to digital infrastructure." Many suspect that the lack of disclosure enforcement has bulldozed political money toward influencers, whose campaigns are not logged in Facebook's political advertising archive. The Federal Elections Commission, too, has scant rules governing social media, leaving the entire field open, potentially, to anonymous money.

The click-per-payment model, DiResta says, may also change influencers' behavior—creating the "incentive to produce and amplify content in the most inflammatory way possible in order to drive the audience to take an action." But at the most fundamental level, researchers voiced a concern about the potential for deception in civic discourse. DiResta said, "I don't think the public really understands the extent to which the people making these posts are, in fact, potentially becoming enriched personally by them."

The ramifications of not disclosing these ties can touch anyone, from your credulous grandmother all the way up to 1600 Pennsylvania Avenue. A knowledgeable person with insight into an Urban Legend campaign described one client's effort to apply pressure on the FCC. According to the person, one of the influencers enlisted was Eric Bolling, a disgraced former Fox News host and one of just 51 people President Trump followed on Twitter. Bolling's post involved a "telecoms issue," with a goal "to apply as much pressure" as possible on the FCC. There were "thousands of engagements overnight" from Bolling's tweet, the person said, which "the FCC commissioner, Ajit Pai, and the president followed and saw."

Today, Bolling's tweet does not appear to be on his feed. Most social media marketing campaigns get deleted when they've run their course, and I found Urban Legend's campaigns to be no exception. Rinat said influencers always know the identity of a client—and followers will know, too, because the link generally takes them to a campaign page, where the sponsor can be identified. Later, he said transparency is "a very important thing to influencer marketing, and particularly for our model. Without it, audience trust drops, and the resulting engagement drops." He also called for clearer rules from enforcement agencies.

While lionizing transparency, Urban Legend continues to shield the identities of its influencers and the clients who pay them. The company's tactfully hands-off approach to disclosure, Farid said, makes the Exchange "a system that is—by design—ripe for abuse."

"At best, the appearance is bad," he continued. "At worst, it's hiding something nefarious."

THE SATIRIST AND CRITIC H. L. Mencken once wrote that "whenever you hear a man speak of his love for his country, it is a sign that he expects to be paid for it." The bone-dry notion that Americans would happily sell anything—even their patriotism—must have seemed like an amusing hypothetical at the time. But perhaps Mencken simply didn't live long enough to see Americans offered the chance.

Last September, HuffPost reporter Jesselyn Cook noted a wave of Instagram posts that seemed to correspond with the timing of a large payment to Urban Legend for "advertising," according to FEC filings, through a partner firm called Legendary Campaigns. The purchase was made by the National Republican Senatorial Committee, which fundraises for Senate campaigns. The posts had headlines like "End to Mask Mandates, Endless Lockdowns and Vaccine Passports!" and demanded "a full investigation into Biden-tech collusion." Each post linked to NRSC petitions, which harvested names and emails.

When I asked Rinat about the posts, he initially said he didn't think the campaigns came from Urban Legend. A few weeks later, however, an Urban Legend client shared with WIRED several backdated screenshots of their influencers' posts. Each of these posts redirected users to a petition by using a highly unusual URL construction, which began "exc.to." According to computer science researchers who examined the string, the top-level domain ".to" is registered to the country of Tonga and has a registration history that cannot be seen. The domain "exc" was registered with the URL-shortening service Bit.ly, which works with private business clients to turn their registered domains into redirect links (such as "es.pn" for the sports network). Since Urban Legend's founding in 2020, "exc.to" could not be found elsewhere on the internet, except in one place: the HuffPost story, in which a 16-year-old's Instagram post for the NRSC bore the telltale URL "END MASK MANDATES: exc.to/3zLvUFB."

When WIRED used third-party search tools to scan Facebook and Twitter for the URL string, it found 726 posts from between July and November 2021. Not long after Cook's report, the use of "exc.to" abruptly stopped. (Since then, Urban Legend's links have used a standard Bit.ly format identical to billions of others on the internet, making them effectively untraceable.) The posts closely matched what Rinat had shared about his creators and clients. Each linked to op-eds, petitions,

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> "RELYING ON FINANCIALLY MOTIVATED INFLUENCERS TO BE ETHICAL IS NAIVE."

or websites of advocacy organizations, including the NRSC, UsAgainstAlzheimer's Action, Canopy, and the Credit Union National Association. But the vast majority of them were about politics, with many sharing identical language in their appeals.

And there were other, more striking posts, which Rinat had not described. Empowered to connect with their value-aligned audiences and elevate causes that made them passionate, the influencers-for-hire let their voices sing.

"The radicals in the left thinks parents who stand up to WOKENESS in our schools are domestic terrorists!" wrote one influencer to their 8 million followers. Another posted: "Thousands upon thousands of unvetted, illegal immigrants are standing by & waiting to rush our border as soon as Democrats pass their 'infrastructure' bill." There were posts from podcasters ("Freedom Over Fauci!"), activists ("The Left is coming for religious freedom AGAIN"), and talking heads ("Democrats want to steal $3.5 TRILLION of our taxpayer dollars"). Creators were also linked to conservative institutions such as Turning Point USA and the America First Policy Institute, and conservative media like Breitbart and Newsmax. Others were unaffiliated, such as the former contestant from *The Bachelorette* who filmed his video appeal without a shirt: "The border's a wreck! I'm getting Amber alerts every day! This is ridiculous!"

In most cases, campaigns led to a page for harvesting emails. But others drove traffic: to conservative publishers like the Patriot Post; to an online course by Hillsdale College; to the Kids Guide to Media Bias; or to pages that appeared to be run by PragerU, the Second Amendment Foundation, and Americans for Prosperity. Occasionally, posters levied more banal appeals ("Take the #Prolife pledge!"). More frequently, rallying cries invoked critical race theory, immigration, and vaccine policies.

Among the creators were several mega-influencers. Donald Trump Jr. posted at least 10 times on Twitter. "Mask Mandates, Endless Lockdowns, and Vaccine Passports. ENOUGH IS ENOUGH," he wrote in July 2021, sharing an NRSC petition. Laura Ingraham, the Fox host, posted twice to Facebook ("Woke teachers are injecting toxic critical race theory into America's schools") and linked to Heritage Action. So did Dan Scavino, former social media adviser to President Trump; former Trump campaign spokesperson Katrina Pierson; and streaming duo Diamond and Silk.

Almost two-thirds of the posts were conservative. But liberals pushed campaigns too: The comedian Walter Masterson was the top contributor on Twitter, posting in support of a $20 minimum wage, while popular travel writer BrokeAssStuart boosted legislation addressing unexpected medical bills. Compared to their conservative counterparts, these posts focused more on policy, not culture wars, and appeared to be sponsored by groups like the Service Employees International Union and the Business Council for Sustainable Energy. There were occasional nonpartisan campaigns, too, such as one by IBM.

The 726 posts do not capture campaigns that were deleted, and they did not cover Instagram or TikTok. WIRED reached out to several creators and clients implicated on the list. None responded to deny their affiliation, and several—Masterson, BrokeAssStuart, the Business Council, and IBM—confirmed that they'd contracted with Urban Legend. When WIRED provided a list of these and other creators and companies, Rinat indicated by email that some have worked with Urban Legend but that others have not, declining to specify further.

Virtually no one—just five influencers—disclosed their payments. Collectively, these posts had some 250,000 engagements. Yet few of the earnest followers who retweeted, say, Trump Jr.—not the grandmother from Alabama, the retired mother from West Virginia, or the Florida small business owner whose bio vows to "expose the DC swamp"—evinced any recognition that what they'd presumed was the dispensation of civic duty was, in reality, just another method for enriching someone in Washington.

Researchers think the major platforms, the FTC, and marketing firms themselves all have a role to play in taming what DiResta calls "a Wild West." Until then, the march of influencers will proceed deeper into politics. In February and March of this year, the NRSC again paid a large sum—more than $500,000—to Urban Legend through a partner firm. "Does this become normal?" DiResta asks. "I think it probably does."

"Here's the irony of this whole thing," says Anat Shenker-Osorio, the progressive consultant. "Urban Legend is relying upon precisely the same thing"—trust—"that it is arguably destroying." Yet if Rinat's model became the norm, even she concedes that "progressive groups would use this thing." She paused. "Because you don't want to unilaterally disarm."

One view of Urban Legend, then, was as a reclamation project—pumping a dwindling supply of trust through a blanched and beleaguered body politic. From another vantage, though, the model resembled something else: an excavation, like the mining of a rare mineral. What happens in a country where trust is a scarce and fading resource, as prized as diamonds? As Mencken would tell you, it gets put up for sale.

Additional reporting by Samantha Spengler.

THE POROUS ROCK BENEATH
THE GULF COAST HELPED LAUNCH
THE FOSSIL FUEL AGE.

/ NOW, AMBITIOUS ENTREPRENEURS
ARE COMPETING TO TURN THIS
UNIQUE GEOLOGY INTO A GIGANTIC
SPONGE FOR STORING CO_2.

/ BY JEFFREY BALL

PHOTOGRAPHS BY KATIE THOMPSON

THE CARBON UNDERGROUND

SOMETIME AFTER the dinosaurs died, sediment started pouring into the Gulf of Mexico. Hour after hour the rivers brought it in—sand from the infant Rockies, the mucky stuff of ecosystems. Year after year the layers of sand hardened into strata of sandstone, pushed down ever deeper into the terrestrial pressure cooker. Slowly, over ages, the fossil matter inside the rock simmered into fossil fuels.

And then, one day in early 1901, an oil well in East Texas pierced a layer of rock more than 1,000 feet below Spindletop Hill, and the well let forth a gooey black Jurassic gusher, and the gusher began the bonanza that triggered the land rush that launched the age of petroleum.

One of the products of the economy that black gold built is the city of Port Arthur, Texas. Perched on the muggy shores of Sabine Lake, just across the border from Louisiana, it's among the global oil-and-gas industry's crucial nodes. Port Arthur is home to the largest petroleum refinery in North America, opened the year after the Spindletop gusher and now owned by the state oil company of Saudi Arabia. The area emits more carbon dioxide from large facilities every year than metropolitan Los Angeles but has a population 3 percent the size. Smokestacks are its tallest structures; nothing else comes close. Around town, pipeline pumping stations jut up from shopping-center parking lots, steam from petrochemical plants hisses along highways, and refineries flank both sides of main roads, their ductwork forming tunnels over traffic. Janis Joplin, who grew up here, described it in a 1970 ballad called "Ego Rock" as "the worst place that I've ever found."

Tip Meckel has a more hopeful view of the place, maybe because he spends so much time looking down. A lanky research scientist at the University of Texas' Bureau of Economic Geology, Meckel has worked for most of the past decade and a half to map a roughly 300-mile-wide arc of the Gulf Coast from Corpus Christi, Texas, through Port Arthur to Lake Charles, Louisiana. Though he's the grandson of a refinery worker and the son of an oil consultant, his interest isn't in extracting more petroleum from this rock. Instead, he has devoted most of his career to figuring out how to turn it into a commercial dump for CO_2.

The idea is that major emitters will hoover up their own carbon waste, then pay to have it compressed into liquid and injected back down, safely and permanently, into the same sorts of rocks it came from—carbon capture and sequestration on a scale unprecedented around the globe, large enough to put a real dent in climate change. Suddenly, amid surging global concern about the climate

→ *Tip Meckel holds a sandstone sample.*

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Pallet 1 of 1

"We're talking about a whole area the size of Texas that you can develop for storage. Who's not going to think that's a good idea?"

crisis, some of the biggest names in the petroleum industry are jumping in.

On the rainy morning I meet Meckel in Port Arthur, the brown-haired geologist is dressed in a blue Patagonia fishing shirt, black jeans, and running shoes, with sunglasses dangling from a leash around his neck. We pile into his gray Toyota 4Runner and head south, through the petro-sprawl, toward the Gulf. We're off to see a patch of ocean that Meckel thinks could be key to the drive for decarbonization.

"You don't throw trash out of your car, do you?" he says as we cruise down a coastal highway, the city receding into the rearview mirror. "Well, we don't want to dump our CO_2 into the atmosphere either." Maybe the problem, Meckel says, is that the gas is invisible. "If it was purple, and the skies had turned purple by now, everyone would be like, 'Shit. We really screwed up.' Maybe they should just dye the CO_2 that's coming out of the stacks and let people see where it goes."

By some estimates, there's enough suitable rock on Earth to lock away centuries' worth of CO_2 emissions, past and future. The Intergovernmental Panel on Climate Change, the world's preeminent climate-science body, has repeatedly affirmed that extensive long-term carbon storage is likely necessary to meet any of its targets to seriously mitigate the overheating of the planet. Globally, in 2021, a paltry 37 million metric tons were sequestered—roughly what the Port Arthur metropolitan area emits in a year. Meckel and his colleagues have worked hard, with millions of dollars in funding from the petroleum industry, the state of Texas, and the federal government, to prove that the Gulf is the best place in the country, if not on Earth, to get this new industry truly ramped up.

The work has focused on mapping the region's underground rock, a process that combines physical evidence, computerized extrapolation, and intuition. Meckel's university lab in Austin holds a gigantic collection of well logs—long paper strips, rather like the printouts from a heart monitor, that reveal instant-by-instant, centimeter-by-centimeter measurements of myriad features of the underworld, typically from sensors that have been carefully lowered thousands of feet into a borehole. (The folded strips are stored in narrow manila envelopes in row upon row of metal shelves in the basement.) Meckel and his colleagues augmented the logs with 3D seismic data, which they got at a discount; the data company selling it had seen a drop-off in interest in the Gulf from oil-and-gas drillers. Armed with that data, Meckel says, they began to "mow the ground" along the coast, methodically assessing it.

The search drew their attention to a layer of sandstone from the Miocene epoch, ranging in age from 5 million to 23 million years old, which lies partly under waters controlled by the state of Texas and stretches into Louisiana. The layer is porous (lots of holes to hold liquid) and sits close to many big polluters (lower piping or shipping costs for the waste CO_2). The sandstone is also covered by a less porous layer of rock that can act as a carbon-tight seal. Meckel and his team built new computer models, then ran simulations of how injected carbon dioxide might flow through the rock. By 2017, they had published an atlas of the Gulf Miocene layer, 74 pages of intricate maps and tiny print.

The year after that, events in Washington transformed the atlas from an academic treatise to an economic playbook. Amid rising climate concern, Congress fattened a federal tax credit for carbon capture and sequestration that until then hadn't attracted much commercial interest. The new subsidy, modeled broadly on ones for renewable energy, gave developers a credit topping out at $50 for every ton of waste carbon dioxide they captured and geologically stored. That $50-per-ton prize coincided with a surge in warming-related natural disasters, which catapulted climate change to the top of many corporate agendas. It also launched the US carbon-storage race. Meckel's atlas, available to anyone, became the racers' guide to the best route.

The result today is that, more than a century after opportunists first swarmed the Gulf to profit from its hydrocarbons, a new swarm has descended, this time to profit from mitigating the damage those hydrocarbons have wrought. A quest that just a few years ago was a science project has become a high-stakes contest to lock up good rock. Within about a 75-mile circle around Port Arthur, more than half a dozen industrial-scale projects are in various stages of preparation.

Their backers include oil giants such as ExxonMobil, ConocoPhillips, BP, and TotalEnergies, which have announced the possibility of more than $100 billion in investments; major pipeline operators, which see human-generated CO_2 as a huge new market; renewable-energy developers who once lambasted fossil fuels but now want to decarbonize them for profit; and landowners who sense a new way to monetize their dirt. A stampede for capital, land rights, and regulatory approval is underway.

Meckel pulls his Toyota into Sea Rim State Park, a beach on the Gulf. The parking lot is open, but much of it is flooded. Roseate spoonbills wade through puddles on the asphalt.

We wander onto the sand. Looking seaward, Meckel points to a line of oil platforms squatting on the horizon. He envisions dozens of new wells drilled in the coming decades, this time to inject CO_2. "We're talking about a whole area the size of Texas that you can develop for storage," he muses. "Who's not going to think that's a good idea?"

Meckel concedes that carbon storage is a "blunt" and "dumb" approach to curbing climate change. "You're basically just landfilling," he says, not decoupling the economy from the production of heat-trapping gases. But with it, he adds, "you buy the time to use the scalpel to do all the cool stuff," by which he means renewables at a scale big enough to power the planet.

Just off this coast sits what may be Texas' most promising site for a CO_2 landfill, a spot to which Meckel is directing my gaze. It includes a well-mapped block of underwater acreage that oil-and-gas insiders call High Island 24L. In Meckel's color-coded atlas, the rock that will likely accept the most injected carbon is rendered in shades of orange and red. The area encompassing this block is crimson. He and his colleagues have studied it intensely and found it to be especially capacious. As the land spreads east, toward Louisiana, the color holds—and the rock does too.

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LAST YEAR, the Texas General Land Office, which leases out state waters for economic activity, held its first auction for carbon-injection rights. On the block was a 360-square-mile patch of Gulf that includes High Island 24L. The winning bid, for a portion of the big patch, came from a joint venture launched by a startup called Carbonvert, which is run by Alex Tiller, an entrepreneur, and Jan Sherman, a veteran of the oil industry. When I meet them one morning in Port Arthur, Tiller is sporting a version of the standard founder uniform—untucked dress shirt, dark jeans, Panerai watch, Tumi briefcase, baseball cap advertising his startup. Sherman is in jeans and an athletic shirt bearing the maroon logo of her alma mater, Texas A&M University. We head outside and pile into the leather-lined cab of a hulking black F350. The license plates read "88GIGEM." That's as in 1988, the year Sherman's husband graduated from college, and "Gig 'em," the Texas A&M motto. Sherman usually drives her BMW SUV, whose plates read "89GIGEM." Tiller drives an electric Audi.

Carbonvert's story dates to 2018. At the time, Tiller, based in Denver, was running a renewable-energy investment fund for a San Francisco financial firm. His specialty was the trade in so-called tax equity. He would find solar developers whose projects qualified for tax credits but whose tax bills were too small to take advantage of them. Then he would arrange deals in which the developers sold their credits—and pledged revenue from five years of electricity sales—to Tiller's investors in exchange for an influx of cash. Tiller knew the game well. He had learned the tax-equity ropes helping build a solar company in Hawaii, whose sale in 2014 brought him a small fortune. When

→ *Meckel interprets a well log.*

→ *Port Arthur's Motiva oil refinery.*

Congress passed the $50 carbon incentive, Tiller says, he pounced on it as an "opportunity to ride a wave that I'd seen before." But he had "zero idea" about burying carbon. So he hit the conference circuit, where he got wind of Texas' coming auction. He heard of Sherman through a friend and reached out to her—a lot.

Sherman fairly bleeds oil. During college, she spent summers fixing leaks on wells. She worked her entire career at Shell, most recently as head of the company's US carbon-storage business. The month before Tiller contacted her, she had retired, having concluded that a new corporate reorganization made it likely many of her team's projects would slow down. Sherman decided she wanted to either go big with the carbon-storage knowledge she had amassed or go home. At first, she didn't answer Tiller's entreaties. "He kind of stalked me," she says. By February 2021, after a few months of nudging, she signed on.

Sherman was skeptical that the state would entrust a big project to an unproven startup. "I didn't think Carbonvert could do it," she says. "I even said, 'I don't think that the world is going to let us do that.'" But Meckel and his colleagues had revealed "a ginormous storage opportunity in the Miocene formation," she says, so the foundational geologic work was done. Sherman and Tiller struck up a partnership with Talos Energy, a Houston-based firm with offshore experience and its own valuable trove of local seismic data. Then they set about figuring out where, in the area that Texas was expected to offer for lease, they thought they could bury carbon in a way that would please both investors and regulators.

The Carbonvert-Talos team focused on areas pierced by comparatively few existing wells, because those can be paths for carbon dioxide leaks. And because each new injection well would cost between $20 million and $30 million to drill, the team avoided geologic features such as synclines—areas where the rock layer dips, as if forming a bowl, effectively cleaving the injectable acreage. Carbonvert and Talos submitted their bid in May 2021. The list of bidders, according to the Texas General Land Office, included much bigger players, among them Marathon Petroleum, an oil company; Denbury Resources, a major pipeline operator; and Air Products, a chemical company. Three months later, Carbonvert and Talos won a 63-square-mile lease. This will be the future home of Bayou Bend CCS (short for "carbon capture and sequestration"). Earlier this year, Chevron threw its weight behind the project, announcing that it would invest $50 million for half of Bayou Bend.

One of the biggest hurdles now for Tiller and Sherman is to sign up enough polluters to make the project economically viable. The business model envisions that polluters will collect the carbon—and the tax credit—and then pay Bayou Bend a transport-and-disposal fee that Tiller says is likely to be $20 to $25 per ton. (That fee could fluctuate.) Scoring clients is a scrappy, dog-eat-dog process. I get a taste of it as Sherman, with Tiller in the back seat, drives me around Port Arthur in the monster truck.

On paper, grabbing carbon emissions in and around this town should be like shooting fish in a barrel. They're not only plentiful but also localized: A small handful of super-emitters accounts for a large part of the output, and a free and easily downloadable federal database reports each facility's emissions. But a refinery, petrochemical plant, or liquefied-natural-gas terminal is a dizzyingly complex collection of industrial processes, each of which produces CO_2 in different concentrations, ranging from near purity to nearly nil. The less concentrated the carbon in a waste stream is, the costlier it is to capture. According to the National Petroleum Council, the $50 tax credit is enough to incentivize sopping up less than 5 percent of US emissions (mostly from ethanol and natural gas processing plants, whose CO_2 emission streams are highly concentrated). But carbon from, say, a coal-fired power plant or a diesel refinery doesn't currently pay to clean up.

Tiller, Sherman, and their partners ultimately hope to inject at least 10 million tons of CO_2 a year to make the profit on which they and their investors have penciled out the project. To get the financing to break ground, the bar is lower—they will need to have inked contracts with polluters to inject 4 million tons a year. By then, however, Bayou Bend will have spent tens of millions of dollars preparing and designing the project. "There is a bit of a build-it-and-they-will-come philosophy," Sherman says.

The crux of the dilemma is that only about 2 million of the 35 million tons of industrial CO_2 emitted annually by large facilities in the Port Arthur area, which includes neighboring Beaumont, is, as Tiller puts it, "low-hanging fruit"—meaning that the tax credit of $50 a ton can cover the cost of capturing, transporting, and burying it.

Back in the truck, which is stocked with 2-pound tubs of honey-roasted peanuts and cheddar Goldfish for long days of sleuthing, Sherman drives us by the oil refinery that opened just after Spindletop. Today it occupies 2 square miles and

← *Jan Sherman and Alex Tiller in front of an oil rig.*

"I DIDN'T THINK CARBONVERT COULD DO IT. I EVEN SAID, 'I DON'T THINK THAT THE WORLD IS GOING TO LET US DO THAT.'"

emits millions of tons of CO_2 every year. "Most of this is all $50 or higher," she says, her right hand on the steering wheel as her left hand sweeps across a windshield filled with the facility.

The next morning, Sherman, Tiller, and I take a boat ride from Port Arthur to the area of the Gulf that they have leased. Over the engine roar, Tiller explains to me that he gave our charter captain only the vague location of the lease area. "He's under NDA"—a nondisclosure agreement—Tiller yells.

← *Portrait of John Geddings Gray.*

When we reach the prospective carbon-injection area, the captain idles the boat. We're in about 40 feet of water; the rock into which the Carbonvert group hopes to inject greenhouse gas is more than a mile and a half below that. I check my phone; it still gets service, because we're only about 5 miles off the coast. To the east, hulking tankers, many of them carrying liquefied natural gas, head out to sea. To the west, every now and then we see a shrimping boat. It's a beautiful morning on the water. And everything in view is belching carbon.

Toward the end of the trip we motor up the Gulf Intracoastal Waterway, a constructed canal that serves as a long driveway in which ships park and take on product from Port Arthur before ferrying it to the world. We pass a biodiesel plant, one of the biggest in Texas, and the boat captain mentions that he used to work there. Sherman plies him for details about the places in the plant that emit carbon. "Where would it come from?" she asks.

Even if the Carbonvert consortium signed up every pound of carbon dioxide it needed, it would still face another hurdle: The US Environmental Protection Agency has yet to issue its first permit for large-scale commercial carbon injection. Permit reviews are widely expected to take years, and the outcome isn't assured. The proposed Bayou Bend project will eventually need as many as 10 injection wells, each of which must win an EPA permit. The timing of that, Tiller says, is "an enormous risk."

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If anyone is at the front of the line of the EPA approval process, it's a man named Gray Stream, the steward of a roughly 100,000-acre patchwork of southwest Louisiana that Meckel's atlas suggests is at least as red as High Island 24L. Stream is a scion of the Louisiana dynasty that owns Gray Ranch, and he's betting that his chunk of Gulf Coast rock gives him pole position in the carbon-storage race. "Mine goes to 11," he tells me, smiling wryly as he evokes a line from *This Is Spinal Tap*, the 1984 mockumentary about a British rock band with extra-loud amplifiers. He hopes the EPA, in particular, will like his ranch's carbon-carrying capacity.

Stream grew up in Nashville and went to college at Vanderbilt, then did a stint as a legislative aide on Capitol Hill. He hoped to become a Navy SEAL officer, but when that didn't pan out he dove into managing the family business. His office is in a former bedroom in the family's business headquarters—a grand, colonnaded red-brick house in the city of Lake Charles built in 1923 by Stream's great-great-aunt, a noted collector of Fabergé eggs. The office is decorated today with intricately carved walking sticks and antique sabers. It overlooks the backyard, which boasts a Japanese tea garden and, as if out of a Faulkner novel, a two-story, octagonal pigeonnier.

Stream assumed his filial responsibilities in 2004, at a time when diversifying beyond oil and gas was becoming increasingly important to the family and the region. That was partly because fields deplete over time, and those beneath Gray Ranch had been pumped for a century. But it was also because momentum in the oil-and-gas industry was starting to shift to so-called unconventional plays—the shale that fracking had unlocked—and Gray Ranch was conventional rock. The surge in shale production was spurring an industrial boom in and around Lake Charles. But on Gray Ranch, as on much of the land along the Gulf Coast, production was in a long decline.

In 2018, when Congress increased the carbon-storage tax credit, Stream started having ideas. He and some colleagues consulted the work of Meckel and others—not only their assessments of the Miocene layer under the Gulf but also an earlier experiment involving a layer of rock called the Frio.

The Frio sits below the Miocene layer. One of its chief allures is that, beneath Gray Ranch, it's particularly thick—and therefore, at least theoretically, able to hold a lot of CO_2. It's also far below sources of drinking water and is topped by the Anahuac shale, which appears to be a carbon-tight caprock. After extensive study, Stream and a team of technical experts he hired decided to bet their bid on the Frio. He says he hopes the EPA will see its combined characteristics as a "belt-and-suspender" approach—a level of safety that will give the agency confidence that his company, Gulf Coast Sequestration, deserves to become the country's first commercial collector of other people's carbon trash.

Applicants for EPA carbon-storage permits must persuade the agency that they can contain both the plume of injected carbon dioxide and a secondary plume of saltwater that the CO_2 displaces from the rock—what drilling engineers call the pressure pulse. The EPA requires evidence that neither plume will contaminate drinking water while a project is operating and for a default period of 50 years after CO_2 injection stops—but the agency can decide to shorten or lengthen that for a particular project.

Stream employs a well-heeled team, including oil industry veterans and a former top EPA official, to shepherd the permit application, which was submitted in October 2020 and which remains, nearly two years later, under agency review. Inside his company, Stream dubbed the carbon-storage play Project Minerva, after the Roman goddess of wisdom (and sometimes of war).

Heading up the technical work is a British petroleum geologist named Peter Jackson, who used to work at BP. His team planned for Project Minerva in much the way Meckel's UT group had mapped the Gulf Coast. Using well-log and 3D seismic data, the scientists modeled the Frio under several tens of thousands of acres on and around Gray Ranch. Then they simulated how the carbon dioxide plume and the pressure pulse would behave, depending on where they drilled wells and how they operated them.

In their computer models, the resulting plume movements appeared as multicolored blobs against rocky backgrounds of blue. The best blobs were round, a cohesive shape that suggests the plume will be easier to control. In other spots, the CO_2 wouldn't behave: Sometimes it escaped upward; other times it spread out like a pancake or, Jackson recalls, "like a spider." Either shape, the team fretted, might degrade project safety and set off alarms at the EPA. The simulations led the Stream team to choose two general locations on the ranch where they intend to drill wells.

← *The Stream family offices in Lake Charles.*

Stream agrees to show them to me one morning. He picks me up in Lake Charles in his decked-out black Chevy Tahoe, and we head west, toward Texas, until we're several miles shy of the state line. We exit the highway at the town of Vinton, Louisiana, and arrive at Gray Ranch. We turn right onto Gray Road. We turn left onto Ged Road. Then, beside cowboy-boot-shaped Ged Lake, we mount a subtle rise known as the Vinton Dome.

These are iconic names in Stream fam-

"The risks of CO_2 going into the atmosphere are more fundamental than the risks of CO_2 going into the ground."

← *Gray Stream visits with the horses at Gray Ranch.*

ily lore. As early as the 1880s, a local surveyor named John Geddings Gray—"Ged"—started assembling this acreage to profit from timber and cattle. Four years after the gusher at Spindletop, Ged saw in the Vinton Dome a topographically similar prospect, and he bought it too. He opened the area for drilling, and his hunch paid off.

Today, the top of Vinton Dome offers a panorama of part of the Stream empire. To the right stand barns bearing the family's cattle brand and quarter-horse brand. All around, rusty pump jacks rise and fall, pulling up oil and gas. Stream, Ged Gray's great-great-grandson, likens the ranch to the cuts of beef he grills for his three young children, who think he's the best steak cooker around. "It's only because I just buy the prime fillet," he says. There's one rule: "Don't screw it up."

We stop at one of the expected well sites. The area around it is resplendent with wire grass, bluestem, and fennel. It's frequented by three kinds of egret: cattle, great, and snowy. This being Louisiana, it's also stamped with a line of yellow poles; they mark the underground route of the Williams Transco Pipeline, which whooshes natural gas from offshore platforms in the Gulf to the interstate gas-distribution system. If it seems strange that this ranch, which for a century has served up fossil fuels, may play an influential part in curbing greenhouse gas emissions, it's also instructive—a measure of how economic signals are changing in a part of the world that has long adapted the way it exploits its natural resources to meet shifting market demand. "People are ultimately going to have to put up" to tackle climate change, Stream says. "They can't just talk about it."

Stream is right: Humanity must choose. As he talks, I'm reminded of Meckel's reaction when, as we stood on the beach, looking out at the waves over High Island 24L, I asked the geologist about the dangers associated with storing carbon dioxide underground. I brought up a bizarre disaster that struck Cameroon in 1986, when a massive, naturally occurring cloud of carbon dioxide suddenly burped up from the depths of Lake Nyos and fell onto nearby villages, crowding out ambient air and asphyxiating to death an estimated 1,800 people. "Now that we know that shit happens, put a sensor down there," Meckel told me, pointing to the Gulf. (At the Cameroon lake, a vent was added.) Meckel doesn't deny there are dangers. But, as he told me in another of our conversations, people "have to decide that the risks of CO_2 going into the atmosphere are more fundamental than the risks of CO_2 going into the ground."

Meckel, of course, was arguing his pocketbook—and that of the fossil fuel industry, which helps fund his work, and of Carbonvert, and of Stream, and of each of the companies now gunning to make a buck from carbon burial. Yet his point stands: Every potential climate fix carries risks.

Storing carbon at a scale large enough to materially help the climate is now, many scientists say, a must. But it would require facing devilishly difficult dilemmas that extend beyond the technical to the philosophical. What level of confidence should regulators demand before blessing a proposed carbon-storage project as unlikely to leak? Who should be held legally responsible for monitoring the safety of injected carbon, and for how long, and with what penalty for failure? Fights between environmentalists and industry over such questions are growing more intense. And yet, as always in the battle over what to do about the climate, if anything significant is to happen, someone will have to budge, and something is almost certain to go wrong.

Along the road from Beaumont to Port Arthur is a museum dedicated to the Spindletop gusher. It houses a life-size replica of part of a turn-of-the-century boomtown—a vision of the good life, lubricated by oil. The museum stages free gusher reenactments, using water. A long wooden boardwalk guides visitors to a pink granite obelisk, where an engraving on the base says petroleum "has altered man's way of life throughout the world."

When the prospectors at Spindletop sold their first barrels of crude, they didn't know the trade-off they were making on behalf of all humanity. They didn't know that the price of cheap energy and better living through petrochemicals would be environmental degradation at planetary scale. We have been playing with fire, and it has warmed us and burned us. This suggests a broader lesson worth remembering as we advance, however slowly, from the age of hydrocarbons through the age of decarbonization to the age of renewables. Maybe, when we encounter energy's next big threat to the environment, we can resist the urge to stick our heads in the sand—and so avoid the last-ditch, multitrillion-dollar, existential slog to bury the problem.

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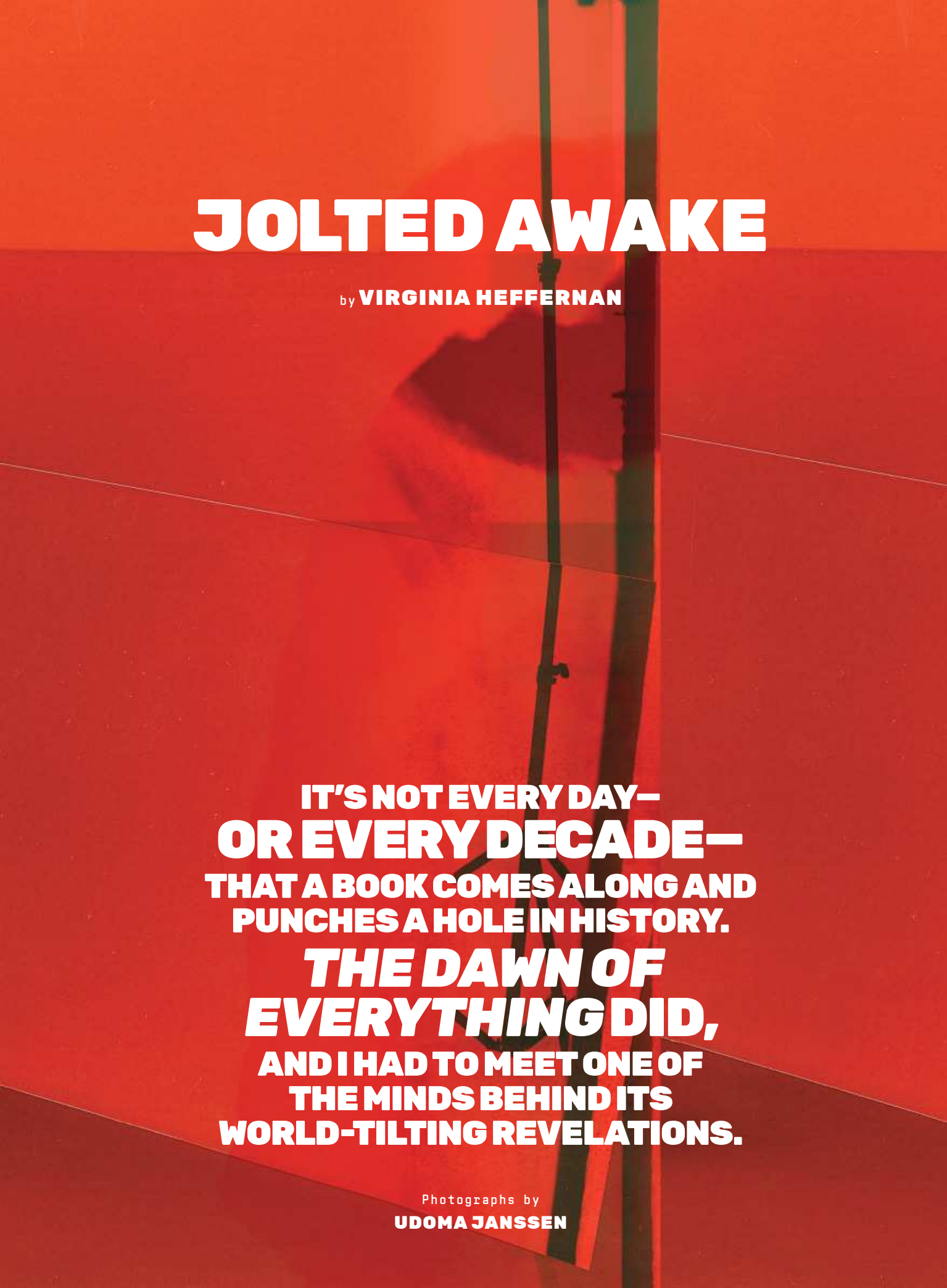
JOLTED AWAKE

by **VIRGINIA HEFFERNAN**



IT'S NOT EVERY DAY—
OR EVERY DECADE—
THAT A BOOK COMES ALONG AND PUNCHES A HOLE IN HISTORY.
***THE DAWN OF EVERYTHING* DID,**
AND I HAD TO MEET ONE OF THE MINDS BEHIND ITS WORLD-TILTING REVELATIONS.

Photographs by
UDOMA JANSSEN

THE PHRASE "the dawn of everything" first struck David Wengrow, one of the authors of *The Dawn of Everything*, as marvelously absurd. *Everything.* Everything! It was too gigantic, too rich, too loonily sublime. Penguin, the book's august publisher, would hate it.

But Wengrow, a sly, convivial British archaeologist at University College London, and his coauthor, the notorious American anthropologist and anarchist David Graeber, whose sudden death in Venice two years ago shocked a world of admirers, couldn't let it go.

Twitter users, after all, dug the title—Graeber had asked—and it suited the pair's cosmic undertaking. Their book would throw down a gauntlet. "It's time to change the course of human history, starting with the past," as the egg-yolk-yellow ads now declare in the London Underground. Wengrow and Graeber had synthesized new discoveries about peoples like the Kwakiutl, who live in the Pacific Northwest; the foragers of Göbekli Tepe, a religious center in latter-day Turkey built between 9500 and 8000 BCE; and the Indigenous inhabitants of a full-dress metropolis some 4,000 years ago in what's now Louisiana.

Citing this existing research, and more from a range of social scientists, Wengrow and Graeber argue that the life of hunter-gatherers before widespread farming was nothing like "the drab abstractions of evolutionary theory," which hold that early humans lived in small bands in which they acted almost entirely on instinct, either brutish (as in Hobbes) or egalitarian and innocent (as in Rousseau). In contrast, the *Dawn* authors represent prehistoric societies as "a carnival parade of political forms," a profusion of rambunctious social experiments, where everything from kinship codes to burial rites to gender relations to warfare were forever being conceived, reconceived, satirized, scrapped, and reformed. In an act of intellectual effrontery that recalls Karl Marx, Wengrow and Graeber use this insight to overthrow all existing dogma about humankind—to reimagine, in short, everything.

They did. The book's a gem. Its dense scholarly detail, compiling archaeological findings from some 30,000 years of global civilizations, is leavened by both freewheeling jokes and philosophic passages of startling originality. At a time when much nonfiction hugs the shore of TED-star con-

David Wengrow lost his coauthor, David Graeber, just after they had completed their 700-page magnum opus.

sensus to argue that things are either good or bad, *The Dawn* takes to the open sea to argue that things are, above all, subject to change.

For starters, the book makes quick work of maxims by domineering thinkers like Jared Diamond and Steven Pinker. Chief among these is the idea that early humans, bent on nothing but the grim chores of survival, led short and dangerous lives chasing calories and subjugating others for sex and labor. By the research, many or even most premoderns did none of this. Instead, they developed expressive, idiosyncratic societies determined as much by artistic and political practices as by biological imperatives. For instance, while the Kwakiutl practiced slavery, ate salmon, and maintained large bodies, their next-door neighbors in latter-day California, the Yurok, despised slavery, subsisted on pine nuts, and prized extreme slimness (which they showed off by slipping through tiny apertures).

Wengrow and Graeber further cast doubt on the assumption that Indigenous societies organized themselves in only rudimentary ways. In fact, their societies were both complex and protean: The Cheyenne and Lakota convened police forces, but only to enforce participation in buffalo hunts; they summarily abolished the police in the off-season. For their part, the Natchez of latter-day Mississippi pretended to revere their all-knowing dictator but in fact ran free, knowing that their monarch was too much of a homebody to go after them. Likewise, the precept that large monuments and tombs are always proof of systems of rank comes up for review. In an especially mind-bending passage, Wengrow and Graeber show that the majority of Paleolithic tombs contained not grandees but individuals with physical anomalies including dwarfism, giantism, and spinal abnormalities. Such societies appear not to have idolized elites so much as outliers.

By the time I was halfway through *The Dawn*, I found myself overcome with a kind of Socratic ecstasy. At once, I felt unsuffocated by false beliefs. I brooded on how many times I'd been told that it's natural to keep my offspring strapped to my chest, or sprint like I'm being chased by a tiger, or keep my waist small because males like females who look fertile, or move heaven and earth to help men spread their seed because that's what prehistoric humans did. This was all a lie. The book's boldest claim convulsed actual glee: Humans were never in a state of nature at all! Humans have simply always been humans: ironic, sentient, self-reflective, and free from any species-wide programming. The implications were galactic.

Given his background, Wengrow has never shaken the feeling of being an outsider in academia.

AFTER

AFTER GRAEBER DIED, on September 2, 2020, not long after alerting Twitter that he and Wengrow had completed their magnum opus, Wengrow found himself both grieving and rushing to finish. The grief nearly knocked him out. But there was one advantage to the hurry: Wengrow stuck "The Dawn of Everything" on the page proofs, too late for Penguin to balk. The sun rose on the book on October 19, 2021, with its golden-hour cover, and soon after it hit the top of the *New York Times* best-seller list.

I first met Wengrow—well, I first met him in Twitter DMs, but we're moving to real life now—in Manhattan, where, over several espressos to brighten his jet lag, we discussed *The Dawn*. I also offered condolences on the death of Graeber. The official cause, which Wengrow was reluctant to discuss, was pancreatic necrosis. But on October 16, 2020, Nika Dubrovsky, a Russian artist and Graeber's widow, wrote that, though she'd shielded Graeber from Covid, he'd occasionally bridled at wearing a mask. "I want to add my own conspiracy theory," she wrote. "I firmly believe [his death] is related to Covid."

Wengrow and Graeber were devoted to one another as few writing partners are. Their collaboration seems to have been a case of true *philia*, the kind of meeting of the minds I associate with J. R. R. Tolkien and C. S. Lewis. Some of this is explained by similarities in their backgrounds. Graeber grew up among working-class radicals in Manhattan, while Wengrow was born to a hairdresser and a partner in a small clothing firm in North London, his grandparents having been, he told me, "gifted people who lost their homes and opportunities

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when the Nazis came to power." Though Wengrow's father later found success in the rag trade, his son was the first in his family to go to college.

Wengrow made it to Oxford in a roundabout way. Having tried to be an actor for a year or two, he thought he'd study English, so he wrote earnest letters to several Oxford colleges to express his lifelong passion for literary studies. When he hit a wall, he canvassed friends about fields of study that might be easier to break into; someone mentioned anthropology and archaeology. He barely knew what these disciplines were, but once again he wrote an earnest letter, this time only to St. Hugh's, assuring the college of his lifelong passion for archaeology. When he went in for an interview, the interviewer held up a sheaf of letters. On top was the letter he'd recently written about his passion for archaeology. The rest were the nearly identical ones he'd written about his passion for literature. The silence was awkward. But he got in. He received his DPhil in 2001.

Nine years later, Wengrow had just published his second book, *What Makes Civilization?: The Ancient Near East and the Future of the West*, which argues that civilizations don't leapfrog from one technological miracle to the next but progress by the gradual transformation of everyday behavior. Having landed in New Orleans for a conference, he was lining up for passport control when a warm, rumpled anthropologist introduced himself: David Graeber. Graeber was impressed by Wengrow's research on Middle Eastern cylinder seals, which he'd described as an early example of commodity branding. In turn, Wengrow was impressed to meet an anthropologist who knew what a cylinder seal is. The Davids stayed in close touch, meeting in either Manhattan or London, and at some point resolved to create a "pamphlet" summarizing new findings in archaeology that undermine many of the stories told about early human societies. For 10 years they talked, one man's thoughts taking up where the other's left off. Eventually they knew the pamphlet would be a book. Determined to preempt critics who'd be eager to pounce on any error, they were meticulous, writing and rewriting each other's work so thoroughly that neither could tell whose prose was whose. The two never stopped exchanging ideas, and they were still planning a sequel to *The Dawn*—or maybe three—when Graeber died.

Given his background, Wengrow has never shaken the feeling of being an outsider in academia. "Oddly, this feeling doesn't go away even when you achieve a degree of recognition and status," he told me. He and Graeber "could relate on that level. And there was a common sense of humor, which comes from the Jewish background. If he hadn't heard from me in a couple of days he'd call and put on a grandmother sort of voice: 'You don't write … you don't call.'"

Everywhere I went with Wengrow, he fielded impromptu elegies for Graeber, who was famous as the author of *Debt* and *Bullshit Jobs*, and as an architect of various anti-capitalist uprisings, notably the Occupy movement. Over our first lunch, Wengrow suggested that the specter of his brilliant friend might still be lurking. (Graeber, whose funeral was framed as an "Intergalactic Memorial Carnival," loved the paranormal.) Indeed, Graeber remained a spirited absence during the time I spent with Wengrow. I pictured him somewhere between a guardian angel and a poltergeist.

The hardest punch thrown by *The Dawn* is its rejection of the assertion that there's no alternative to capitalism.

THE NEXT TIME I saw Wengrow was in April in Dublin, to grab a bite at a … what was this place? A disco or a ballroom, loosely attached to a hot-dog stand, at which hot dogs were sold out. Wengrow was unbothered. He and his wife—Ewa, who was trained in archaeology and now works at the British Library—companionably split a burger. After dinner, Wengrow was scheduled to address a group of labor activists about matters archaeological, but for now we discussed Irish politics, and in particular the vexing matter of Facebook's and Google's long-time use of Ireland as a tax haven (an arrangement that seems to be ending).

The gathering had been organized by Wengrow's host in Dublin, Conor Kostick, an Irish sci-fi writer, champion of the 1950s board game Diplomacy, and devoted leftist. Captivated by *The Dawn* soon after its publication, Kostick had emailed Wengrow, inviting him to speak to a small group at Wynn's, an old Victorian hotel and pub on Abbey Street and a short walk from the hot-dog disco. Kostick's invitation showed some chutzpah. If Wengrow took it up, he'd have to break up the extravagant victory lap that had been his book tour in the US to address a few dozen labor activists, trade unionists, and scruffy anarchists in a modest venue. He'd also be coming to Dublin by way of Vancouver, where he had just been flown business class to give a TED talk, on a docket with Elon Musk.

Wengrow said yes without missing a beat. Kostick tweeted: "Imagine Darwin was coming to #Dublin, to speak about his new book On the Origin of Species. Well that's how I feel about being able to hear @davidwengrow's talk next Thursday." The invitation was just what Wengrow needed, he told me, a sort of anti-TED, "to keep mind and soul together."

Wengrow considered TED both cultlike and fascinating. Reflecting on the experience with Kostick and me, Wengrow spoke animatedly about Garry Kasparov, the chess champion and Russian dissident who'd kicked off the conference with a speech about the war in Ukraine. Wengrow had no contact with Musk (about whom he appeared to know little, and care less) and joined forces instead with Anicka Yi, a conceptual artist who works largely in fragrance, and the feminist author Jeanette Winterson. "They were great company and reminded me what I was there for, which was to get the message of my work with David Graeber out there in a place where you might least expect to find it." Munching on his burger, he still seemed dazed by a single data point: Attending TED can cost $25,000. Kostick, who has a ponytail and the vibe of a Roz Chast character, refused to take that in. The average annual salary for an Irish laborer is about $35,000.

Weeks later, I watched Wengrow's TED talk. In khakis and an oxford-cloth shirt buttoned to the top, he cited his fieldwork in Iraqi Kurdistan to debunk the stubborn fallacy that a make-believe "agricultural revolution" ruined humanity by creating stationary societies, private property, armies, and dreadful social inequality. On the contrary. Some early farming societies rejected these traps for 4,000 years and traveled far and wide, spreading innovations from potter's wheels to leavened bread across the Middle East and North Africa. Cities in the Indus Valley from 4,500 years ago had high-quality egalitarian housing and show no evidence of kings or queens, no royal monuments, no aggrandizing architecture.

The hardest punch thrown by *The Dawn* is its implicit rejection of Margaret Thatcher's infamous assertion that "there is no alternative" to feral capitalism, a claim still abbreviated in Britain as "TINA." Laying waste to TINA, *The Dawn* opens a kaleidoscope of human possibilities, suggesting that today's neoliberal arrangements might one day be remembered as not an epoch but a fad.

The title of Wengrow and Graeber's book—*The Dawn of Everything: A New History of Humanity*—was workshopped on Twitter.

ME

WE STROLLED a few blocks to the hotel, where the upstairs lecture room seemed like something out of a pub scene in *Ulysses*. Voluble young radicals filed in, bedecked in buttons of esoteric meaning. Rhona McCord, a socialist and anti-fascist representing Unite, a massive trade union, stood up to encourage people to join. For as little as 65 cents a week. We were far from the Gulfstream brotherhood of TED.

Surrounded by students and leftie hotheads, Wengrow was in his element. I asked a Covid-masked anarchist, who went by the mononym Shane, about *The Dawn of Everything*. "It's a really hopeful book," he said. "It's very easy to get trapped in that mental thing of, 'Nothing's ever going to change. It's just going to be the same neoliberal, state capitalist thing forever.' But a lot of the book is just saying, 'No, we can change.' We have been doing that for the entire time that humans have existed." I turned to Liv, a Portuguese anarchist whose buttons excoriated the foes of the working class and commemorated the Spanish Civil War. "We have to make a change. And it has to be as fast as we can, otherwise … it will kill us all." I heard this from other *Dawn* enthusiasts. The book delivers jolts to the system, and—in some readers—shakes defeatist notions that human exploitation is inevitable.

But why have we felt so defeated, so locked into TINA, I wondered. As I took my seat, a plaintive passage from the book popped into my mind: "How did we come to treat eminence and subservience not as temporary expedients … but as inescapable elements of the human condition?" The poltergeist in the air was insistent: Why do we put up with this?

From the lectern, Wengrow asked that no recording be made. He likes synchronous human exchange in person or by telephone, and he welcomes questions and disruptions. While composing *The Dawn*, Wengrow and Graeber built arguments to the tune of their own overlapping voices, interruption, enthusiasm, dissent, doubt, and rapturous agreement.

Early in the book, the Davids even offer a spontaneous celebration of dialog as the engine of philosophy. "Neuroscientists," they write, "tell us that … the 'window of consciousness,' during which we can hold a thought or work out a problem, tends to be open on average for roughly seven seconds." This isn't always true. "The great exception to this is when we're talking to someone else … In conversation, we can hold thoughts and reflect on problems sometimes for hours on end."

The same collaborative meaning-making was in evidence at Wynn's, where Wengrow was receptive to everyone, even the inevitable town-hall shaman who stood and delivered a mumblecore homily about … something. For an academic superstar with a theory of everything, Wengrow lacked arrogance in an uncanny way, the way someone else might lack eyebrows.

The lecture touched on something called Dunbar's number: the influential if dubious thesis by evopsych anthropologist Robin Dunbar that humans function best in groups of up to 150 people, implying that in bigger groups, they need guns, monarchs, and bureaucracy lest they become unruly. A bite-size idea, the kind of pro-cop, pro-executive palaver that animates airport books about "management" and "leadership." But then Wengrow pointed to actual archaeological evidence. In December, researchers Jennifer M. Miller and Yiming Wang published a study of ostrich-eggshell beads that were distributed over vast territory in Africa 50,000 years ago, suggesting that early human populations lived in attenuated social networks of far more than 150 people and kept cohesion and peace without police or kings.

I left Wynn's while Wengrow was still talking animatedly to a pair of Gen Z activists, holding thoughts and reflecting on problems for hours on end.

For an academic superstar with a theory of everything, Wengrow lacks arrogance in an uncanny way.

WENGROW

WENGROW AND I met the next day too. I didn't think any lecture could be less glitzy than the event with Kostick and the 65-cents-a-week Unite membership, but I was wrong. The final talk Wengrow gave in Ireland was at University College Dublin, and there was not a CEO or tattooed fanboy in sight. This time the audience—in a narrow gray lecture hall with an undersized platform on which four academics balanced precariously—was made up of a few dozen laconic academics. At UCD, Wengrow's sponsor was Graeme Warren, vice president of the International Society for Hunter-Gatherer Research. Where Wengrow had referred to the Wynn's gig as one for "trade unionists," this one was for "hunter-gatherers."

As I got my bearings in the windowless auditorium, the social dynamics came slowly into focus. At last, one of the men, sitting alone at the edge of the audience, emerged as important. When he started

to speak, I recognized the room's suspense from my own tour in graduate school; he was donnish, oracular, the one whose opinion matters. Would he like *The Dawn of Everything*? Sweetly, Wengrow himself seemed deferential. The suspense broke when the man—I later learned he was Daniel Bradley, a geneticist at Trinity College Dublin—offered a technical observation about the book, and then shook his head in pure astonishment at the achievement.

Wengrow was pleased. But he was no less delighted when a baby-faced lecturer, Neil Carlin, proposed in a deceptively gentle brogue that Wengrow had gone wrong in his analysis of Stonehenge. Didn't *The Dawn*, Carlin asked, merely rehash the mainstream account of Stonehenge's construction? Carlin's gall was exciting, but my ears pricked up for another reason. Finally. An archaeological site I'd heard of.

"There's a very big presence on my shoulder as I speak about this," Wengrow said. That would be, I gathered, Michael Parker Pearson, one of Wengrow's colleagues at UCL, the ranking expert on Stonehenge and an archaeologist whom some consider Anglocentric. Had Wengrow crossed up his book's own thesis by failing to question orthodoxies, especially the ones that credit imperial powers like England with all great human achievements? The upstart Carlin was sidling uncomfortably close to charging Wengrow with sycophancy or even careerism.

Wengrow wasn't thrown. He's indifferent to wolf-pack dynamics everywhere, most of all in academic settings. A preoccupation of *The Dawn*, after all, is the contingency of hierarchies. They come and go, sometimes literally with the weather; any system of seniority and groveling is a joke; we are hardwired neither to rule nor to be ruled over. In particular, Wengrow's own newfound status as an archbishop of archaeology, Mr. $25K-a-membership, struck him as laughable. As Jacques Lacan wrote, "If a man who thinks he's a king is mad, a king who thinks he's a king is no less so."

While Wengrow had received posh plaudits in Vancouver, and whoops of support at Wynn's, he seemed to find full-contact dialog with the UCD archaeologists most gratifying. And stimulating. The eye-opening questions, the testing of ego, the swerves in and out of accord. Reflecting on his collaboration with Graeber, Wengrow ventured that university management has made academia so sterile that making friends within it has become a radical act. "In that way, too," Wengrow said, "our relationship was going against the grain."

True to form, Wengrow earnestly considered Carlin's Stonehenge questions, and even made notes. Later, he gave the critique a complete hearing in an email to me. As with the missing hot dogs, Wengrow was unbothered.

LIKE THE DEATH of Wengrow's intellectual soul mate, *The Dawn* opens far, far more questions than it closes. The book's several critics seem to balk at its ambition more than its research. Some say its idea of the dawn of everything, beginning 30,000 or so years ago, is more like its teatime. Others say Wengrow and Graeber are so eager to find anarchism and feminism in early civilizations that they shade the data.

In the book's final chapters, clouds pass overhead. The authors land on the puzzle of modern "stuckness"—the idea that we have lost the experimental spirit that makes humans human and settled into the ruts of our capitalist-neoliberal hellscape. This works as a rhetorical move: No one wants to be stuck, and dread of this fate can impel a person to action. But as an overarching theory, the idea that humans moved from freedom to stuckness seems to reinscribe some of the schematic evolutionary folktales that the book exists to critique. And if our spirits were flying along just fine, creating new worlds until they were all simultaneously crushed by Thatcherian capitalism, isn't this just a new fall-from-grace story, like the ones that said humanity was wrecked by agriculture or urbanization or the internet?

Contemporary society strikes me as far from stuck. Precarious and imperiled, but not stuck. The pandemic, for one thing, threw into relief the proliferation of cultlike groups that reject modern medicine and even modernity itself. More encouragingly, young workers everywhere are organizing, protesting, and taking to the road in record-high numbers. Gender and race are being reimagined. Any or all of this might be threatening or vertiginous or worse, but none of it suggests stuckness.

Wengrow didn't worry too much about my objection. He holds ideas lightly, and if the "stuckness" concept didn't land for me, he said, maybe I could just let it go. The book supplies hundreds of rich examples of early societies that didn't conform to evolutionary stages. The research is what most excites Wengrow. The imperative to act on our humanness—to refuse to sleepwalk, to refuse to get stuck—grows out of the scholarship.

Over drinks after the lecture, Wengrow talked, when pressed, about his book, but he already seemed to be testing new intellectual territory—the cult of TED, ostrich-shell currency, good old Stonehenge. Academic careers, like all human endeavors, don't have to be only about prizes or disgrace. There is so much to study. There are worlds to imagine. Call it TAAL: The alternatives are limitless.

HIGH

PHOTOGRAPHS BY TONJE THILESEN

AS PSYCHEDELIC THERAPIES GO MAINSTREAM, PHARMACEUTICAL COMPANIES ARE RECRUITING CHEMISTS TO CREATE PATENTABLE—AND PROFITABLE—VARIATIONS OF POWERFUL HALLUCINOGENS. CRITICS THINK IT'S ALL A BAD TRIP. —— BY JOHN SEMLEY

THIS IS WHAT HAPPENS WHEN A MOUSE TRIPS OUT:

IT BECOMES MORE curious about other mice and more likely to socialize with them for long periods of time. It becomes less likely to glug massive amounts of alcohol. It wriggles, quavering, like a wet dog shaking off rain. And its head twitches, rapidly, side to side.

Because a mouse on LSD cannot tell you that colors seem brighter or the walls are melting or a guitar solo somehow *sounds* purple, these head twitches are of tremendous importance to chemist Jason Wallach. "If you want to know if a compound is likely to cause a psychedelic effect in humans," says Wallach, speaking from his tiny office in the Discovery Center at Saint Joseph's University in Philadelphia, "you look to the mice, to that twitching."

These twitch tests—and countless others—are part of Wallach's mind-bending new mandate, sparked by a late-2019 meeting with the heads of a company called Compass Pathways. The UK-based biotech firm was eyeing the possibilities of developing psychedelic drugs for use in mental health therapies. Its core product was psilocybin, the psychoactive compound in magic mushrooms. But it needed *new* chemicals, engineered to deliver consistent, optimized, and potentially radical results. And that meant new chemists. By August 2020, Compass had inked a two-year, $500,000 "sponsored research agreement" with Wallach and the university. The Discovery Center was born.

A few years in, with continued support from the company, Wallach has cooked up scores of novel psychedelics, mailed them off to partner labs for testing on those mice, and then waited—and hoped—for the telltale twitch results. The chemist, 36 and pale, face framed by a rough red beard and rectangular glasses, can hem and haw a bit when it comes to specifics: "Compass doesn't want me to give out numbers. I'll say we've made *a lot*." It's in the neighborhood of 150 new drugs, all of which can potentially be patented and sold by Compass.

We are, as you have probably read, in the throes of a "psychedelic renaissance." Compelling clinical work conducted at New York University, Imperial College, Johns Hopkins, and elsewhere showed that long-outlawed drugs such as N,N-dimethyltryptamine (DMT), LSD, and psilocybin have terrific potential for treating everything from addiction to Alzheimer's to end-of-life anxiety. Pharmaceutical companies have taken note. In 2020 the fledgling psychedelic industry was predicted to balloon to $6.9 billion by 2027—a year later, that estimate increased to over $10 billion. In September 2020, Compass became the first company of its kind to trade on a major stock exchange, debuting on the Nasdaq at an estimated value of more than $1 billion.

So far, none of these companies has brought a psychedelic drug to market, but the thinking is that, through what the clinical literature calls a "mystical-type experience"—a psychedelic trip that produces feelings of joy, peace, interconnectedness, and transcendence—patients can confront the root causes of various mental maladies. "I don't want to use the word *cure*, but psychedelics can offer long-term healing," says Florian Brand, the cofounder and CEO of a Berlin-based biotech incubator called Atai Life Sciences, which invested in Compass Pathways. "We have put a lot of money into actually exploring this hypothesis."

At the Discovery Center, Wallach leads a team of about 15 students, researchers, and technicians. "One thing we do," he says, "is create new compounds that differ just a bit from classical psychedelics, like psilocybin or LSD." Slight tweaks in the molecular structure can drastically alter the intensity and character of the psychedelic journey. This ability to fine-tune the contours of a trip—to engineer new modes of experience—is Wallach's passion.

For years, his lab work seemed utterly niche, bordering on verboten. Mentors discouraged him. There was no money in psychedelics, they said. There were rep-

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Jason Wallach is charged with creating new psychedelics, engineered to deliver consistent, optimized, and potentially radical results.

utational risks. After all, many of these drugs have been ruled by the US Drug Enforcement Administration as possessing "no currently accepted medical use." Since the US government declared most psychedelics illegal in 1970, such research had typically been the domain of so-called clandestine chemists, who worked in backyard sheds and underground bunkers, mass-producing trippy new compounds while evading law enforcement.

Wallach wasn't discouraged. The work felt about as close as one could get, professionally, to pure chemistry, he says—research animated almost entirely by personal curiosity: "What happens if you put a bromine here? What if you move it over there?"

New investment is shaking up those ideals, as firms like Compass rush to capitalize on the results of that curiosity. A few years ago, Wallach was conducting experiments and coauthoring articles for relatively esoteric journals of neuropharmacology. Now his once quiet lab, with its beakers and burners and reports on twitchy mice, is helping usher in a new era of Big Neuropharma—and not everyone in the world of psychedelia is thrilled about it. Compass has come to embody the potential (and looming threat) of "psychedelic capitalism." And Wallach is one of its most prized assets. The young chemist is all in. But the financial stakes, and the ideological fault lines emerging as psychedelics go corporate, produce new stresses. "In the long run, this research is valuable," he says, before giving his head a shake. "But on a day-to-day basis? It does nothing but raise my blood pressure."

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Wallach's once quiet lab is helping usher in a new era of Big Neuropharma.

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WALLACH'S LIFELONG, incurable obsession with psychoactives kicked in when he was a kid in the '90s. It was the Just Say No era, complete with egg-in-the-frying-pan, "This is your brain on drugs" public service announcements. The messages didn't have the intended effect on Wallach. In fourth grade, when other kids were devouring *Goosebumps* and Judy Blume paperbacks, he discovered a book in the school library outlining the dangers of various drugs. "Something drew me to it," he recalls, "that a small amount of powder or material could cause a really strong change in someone's experience."

Years later, Wallach had his own psychedelic experiences, and although he demurs on the details, they proved life-altering. "I pretty much dedicated every waking hour almost for the past 15 years to studying them," he says. "They had a profound impact on how I wanted to spend my life."

With few sanctioned pathways for making a living studying psychedelics, Wallach enrolled at Indiana University of Pennsylvania, where he studied psychology as a portal to the mysteries of the human psyche. Wallach was especially curious about consciousness: Where do thoughts come from? What's the difference between the brain and the mind? How do we perceive things such as taste and sound and color? How do we perceive ... anything at all? Not long into his first year of undergrad, Wallach realized that psychology was "a little less empirical" than he had hoped. He switched majors to study cellular and molecular biology.

Wallach began conducting research in synthetic organic chemistry—building compounds that occur in nature. He examined cannabinoids, the psycho-

active compounds in cannabis. A voracious reader of textbooks, he noticed Amazon's recommendation algorithm pushing two curious titles: *PiHKAL* and *TiHKAL*. These chunky reference books from the '90s were written by Alexander "Sasha" Shulgin—a psychopharmacologist best known for synthesizing MDMA, also known as ecstasy—and his wife, Ann. They contain detailed accounts of various psychoactive compounds, based on firsthand trials conducted by the Shulgins and a close cadre of fellow travelers.

The books are, as a spokesperson for the DEA once put it, "pretty much cookbooks on how to make illegal drugs." Wallach immediately ordered the two volumes and got cooking. He calls them "probably the most useful tools for answering some of the questions I was interested in at the time, about consciousness and the mind-brain relationship."

Following the Shulgins' step-by-step instructions, Wallach taught himself how to make psychedelics. During breaks from school, he threw together an ad hoc lab in the basement of his parents' stone farmhouse in Bucks County, Pennsylvania. When his mom started complaining about the smell, he moved the whole operation to a small carriage house on the property. There, Wallach continued to synthesize psychedelics, preparing everything he could physically (and legally) manage. "To be clear," he says, "I was very paranoid."

Wallach fell in love with the work. While his parents may have flinched at the tart stenches—and the serious risk of their son accidentally manufacturing compounds that merit harsh penalties under the DEA's Drug Scheduling system—they were happy to see him throw himself into something so completely. After graduating in 2008, Wallach enrolled at the University of the Sciences (which recently merged with Saint Joseph's University) to pursue his PhD in pharmacology and toxicology. To continue studying psychoactives, when applying for grants he pretended to buy into the same antidrug hysteria he had dismissed as a skeptical schoolkid, framing his research as investigations into dangerous compounds. "The angle was, these are drugs of abuse, and we want to understand them," he says. "Whatever you have to tell the grant agency."

But a little academic subterfuge was a small price to pay to nurture his obsession. When Wallach is not synthesizing psychedelics, he's lecturing about psychedelic synthesis. When he's not lecturing, he's reading the latest literature. Even when he's at home with his wife in West Philly, ostensibly watching TV, he's still reading about pharmacology. And when he's not doing that, he's teaching himself math. Or electronics. Or advanced physics. He wants to keep his brain sharp. Everything feeds back into the research. He assures me that he has interests outside of the hard sciences. He collects antique snuff boxes. He compulsively chews nicotine gum, which he believes sustains his focus. He swears he even chews it while brushing his teeth. He enjoys the odd cigar, too. Save for the occasional scotch, he abstains from alcohol, which he calls ethanol. "I like the taste," Wallach says, but he can't suffer the more mind-dulling effects. "I hate if I even start to feel buzzed at all." In one conversation, when I ask him how his weekend was, he tells me he spent his days off using plastic model kits to design potential molecules. He has even found himself toiling in the lab on Christmas Day.

"This is my life," Wallach says. "There is nothing else I'd rather be doing. If I was given a billion dollars, today, the first thing I would do is build a superlab." When Compass came calling, he finally got the golden opportunity to pursue that dream. Maybe not a full-blown, billion-dollar superlab. But a lab of his own.

IN 2020, THE FLEDGLING PSYCHEDELIC INDUSTRY WAS PREDICTED TO BALLOON TO $6.9 BILLION BY 2027—A YEAR LATER, THAT ESTIMATE INCREASED TO OVER $10 BILLION.

IN POP CULTURE, psychedelia is a Day-Glo tapestry of mandalas, black-light inks, tie-dye, and phat pants embossed with lime-green alien heads. In their various states of synthesis and manufacture, psychoactive drugs are decidedly unkaleidoscopic: brownish, yellowish, and vaguely gross, like plaque scraped off nicotine-stained teeth. The labs where these drugs are synthesized smell as if someone were burning a Rotten Eggs Yankee Candle.

Last fall, I visited Wallach in his lab, where he was preparing some N,N-dipropyltryptamine—a legal, and extremely potent, hallucinogen. Dressed in a faded maroon polo, khakis, and chunky desert boots, Wallach sets up a reaction in a round-bottom flask while explaining that in the '70s, scientists investigated DPT for use in psychotherapy. He flits around the lab, blasting out moisture from glassware, sealing tubes with argon gas, dissolving reagents in methanol, and advising me to keep my distance as he fiddles with substances that are, he warns, "fairly toxic." It's like watching a chef show off at a teppanyaki restaurant, slicing and dicing by pure reflex.

The fall semester is in session, and Wallach has returned, after the pandemic disruption, to in-class teaching. His lab—and its work for Compass—presses on. Wallach and his squad of mostly twentysomethings weave among a few different offices, testing compounds for purity, sketching out molecules in grid-lined notebooks, and preparing potentially mind-expanding substances in discreetly marked mailers to be sent for mouse-twitch tests at a partner lab at UC San Diego.

The job is to develop drugs that tickle the 5-HT2A receptor, a cellular protein involved in a range of functions—appetite, imagination, anxiety, sexual arousal. The receptor has proven crucial to understanding the neuropharmacology of the psychedelic experience induced by classical hallucinogens. LSD, mescaline, psilocybin—they all interact with 5-HT2A. (In certain circles, the phrase "5-HT2A agonist" has supplanted "psychedelic," which still carries faint whiffs of hippie-era hedonism.) "If you're designing a new version of a classical hallucinogen," Wallach says, "the first thing you're doing is looking at its interaction with that receptor."

One of Wallach's goals is to hack how long a psychedelic's effect lasts. Full-dose psilocybin trips usually run in excess of six hours. Hand-me-down hippie wisdom dictates three full days for a proper LSD experience: one to prepare, one to trip, and one for reacclimating yourself to the world of waking, non-wiggly consciousness. From a clinical perspective, such epic sessions are expensive and may not be necessary. Meanwhile, drugs like DMT are acute and intense, with effects lasting only minutes (sometimes called "the businessman's trip" because it can be enjoyed within a typical lunch hour). Finding what Compass cofounder Lars Wilde calls "the sweet spot" between the length of a trip and clinical efficacy is just one of Wallach's many challenges. If he and his team of researchers happen upon a concoction that's particularly potent or experientially unique—"cool" is a word that gets tossed around a lot—well, all the better.

All around the lab, the shelves are cluttered. On a fridge stocked with uncommon chemical provisions is a mission statement scrawled in black Sharpie: "Shoot 4 the stars / land on Mars." Artwork adorns the walls—impressionist scenes painted in long globs by Wallach himself. Cabinets housing beakers and flasks are decorated with printouts of notable scientists, like a wall of saints. There's "father of psychopharmacology" Nathan S. Kline; Albert Hofmann, the Swiss chemist who discovered LSD; and in lab whites and a jaunty beret, smoking an enormous pipe, is Sasha Shulgin, who died in 2014 at the age of 88.

Wallach wouldn't be working with DPT if it weren't for Shulgin, who first synthesized the drug. In one of his trip reports, Shulgin describes smoking "many mg" of DPT and being treated to a vision of two rotating hearts, interlocking like something from a drugstore valentine. "Around the outside," he writes, "there were sparkling jewels or crystals of light of different colors, maybe four rows deep surrounding them all around."

Shulgin is a key influence for many in Wallach's lab. "He was authentic and honest, both as a researcher and as a person," says Jitka Nykodemová, a 27-year-old graduate student who moved from Prague to Philadelphia to work with Wallach. Shulgin feared that government agents might one day lay fire to his personal records, so he packed his life's work into a few textbooks. Now, his oeuvre is available online at no cost. Wallach's operation is more of a closed book. Slinking through the Discovery Center, snapping photos for reference, I'm cautioned against stealing away with any proprietary chemical names or structures. All of the lab's discoveries belong to Compass, transferred via an "exclusive, royalty-bearing, worldwide license."

"THERE'S A PERCEPTION of Compass as being the ogre," says Graham Pechenik, a patent lawyer focusing on the emerging psychedelics industry. He's talking about the company's trajectory and its clashes with old-timers who bristle at the idea of psychedelics going corporate.

Compass started off as a nonprofit in 2015 but switched, just a year later, to a for-profit model and accepted funding from, among others, controversial

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All of Wallach's discoveries belong to Compass, transferred via an "exclusive, royalty-bearing, worldwide license."

venture capitalist Peter Thiel. In December 2019, Compass received a patent for a method of synthesizing psilocybin. To some competitors, the patent seemed to give the company a monopoly on a compound that humans have used for thousands of years. Peter Van der Heyden, once a clandestine chemist and now the cofounder and chief science officer of Psygen Labs, a private manufacturer of pharmaceutical-grade psychedelics, calls the patent "unconscionable."

"It just doesn't jibe," says Van der Heyden, 70, "with what a whole group of us—shall I say, people with roots in the '60s and '70s—have spent years of their life, and sometimes years in jail, working toward. It's something that is supposed to be—I don't know how else to say it—a gift to mankind." His objections have an ideological bent. His generation framed the psychedelic experience within hippie-era values of peace, love, and smiling on one's brother. These drugs were once seen as a tonic: a chemical rejoinder to the culture of corporate profiteering.

Compass has also applied to patent protocols for conducting psychedelic therapy, including conventions that have arguably been part of psychedelic therapy for decades, if not longer, such as soft furniture and "reassuring physical contact." As one critic put it to me, Compass was trying to patent hugging.

A consortium of chemists and competitors recently challenged Compass' claims in a patent review trial. Some in the industry maintain that the company's method of synthesizing psilocybin apes techniques devised by LSD pioneer Hofmann, who filed patents on manufacturing psilocybin over half a century ago. The charge was spearheaded by Carey Turnbull, a former energy broker who founded a nonprofit watchdog group, Freedom to Operate, to fight psychedelic patent claims. (Among his personal effects at his estate in the gated hamlet of Tuxedo Park, New York: a Chanel-branded, diamond-encrusted statue of the Buddha.)

Turnbull is also the founder and CEO

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of Ceruvia Life Sciences, a for-profit company that's pursuing pharmaceutical applications of psilocybin and other psychedelics. In other words, in addition to playing the role of psychedelia's patent overreach patrol, Turnbull is Compass' direct competitor.

In an open letter published on Freedom to Operate's website, Turnbull claims Compass is "not making good-faith use of capitalism or pharma regulations" by attempting to establish itself as an exclusive, global supplier of psilocybin. In Turnbull's view, Compass is laying claim to an existing invention (psilocybin, and specifically Hofmann's synthetic formation) with an intent to "ransom it back to the human race." Freedom to Operate recruited a platoon of scientists to examine Compass' psilocybin and scoured the globe for vintage samples of Hofmann's version. Their research claims that Compass' molecule—and the method for its production—is far from novel.

Compass executives, naturally, disagree. They maintain that their patents are in place to protect their legitimate intellectual property, enabling them to bring their treatments to the greatest number of patients possible. They also insist that they aren't claiming some monopoly on psilocybin *itself*—only the process for producing a particular synthetic form. In June, the Patent Trial and Appeal Board sided with Compass, ruling against Freedom to Operate's challenge. Compass Pathways CEO George Goldsmith assures me his company is not trying to thwart anyone from gobbling a mind-expanding mushroom cap. Cofounder Wilde, likewise, swears that Compass isn't cornering the market on hugs. Both Goldsmith and Wilde exhibit the corporate tendency to stay frustratingly on message. Ask them what they had for breakfast and they'll tell you how excited they are to build a new future for mental health. But pressed about his company's image, and the efforts mobilized against it, Goldsmith's consummate professionalism slips, if only a bit. "Freedom to Operate?" he chuckles, a little anxiously, from his London office. "There's no constraint. Operate, already."

Wallach isn't particularly ruffled by the swampy ethics of psychedelic capitalism. After all, it's business as usual. The so-called "Hippie Mafia" of the '60s and '70s—led by superstar LSD chemists Tim Scully and Nicholas Sand—were bankrolled by the freaky scions of the Mellon robber baron dynasty. Wallach's hero, Shulgin? He paid for his far-out chemical experiments with his day job developing insecticides and other chemicals at Dow, all while the company was mass-producing napalm for the Vietnam War.

Nor is Wallach moved by the charges leveled at Compass. "I'm definitely aware of those criticisms," he says. "But I have no reservations." For Wallach, corporate involvement seems preferable to the alternative, in which all decisions around the research, scheduling, and distribution of drugs fall to the government. His voice shifts a bit when he says *the government*, as if the term were suspended in spooky air quotes. He reserves no fondness for the DEA, which continues to impose severe penalties for the possession and manufacture of mind-expanding drugs, psychedelic renaissance notwithstanding. (Wallach planned to trek to DC in late summer to make a court appearance officially opposing the designation of N,N-diisopropyltryptamine—another Shulgin discovery—as a Schedule 1 narcotic.)

But his antipathy stems from more than the tangles of bureaucratic red tape he has to wade through to do his work. He counts at least 10 close friends who have overdosed on synthetic opioids. He keeps photos of some of them in his home office. (The government of his native Pennsylvania has identified opioid overdoses as the state's worst public health crisis.) Wallach has seen students struggle and suffer. He rails at a system that still views drug use and addiction as moral issues, punishable to the full extent of the law, and not medical ones to be addressed, compassionately, through science—recent literature suggests that psychedelic therapies may help treat substance use disorders. "It definitely drives me," he says, holding back tears. "I want to prevent that loss for other people. And improve people's existence. We could have a paradise on this rock of ours floating through space."

IN ONE CRITIC'S VIEW, COMPASS IS LAYING CLAIM TO AN EXISTING INVENTION (PSILOCYBIN) WITH AN INTENT TO "RANSOM IT BACK TO THE HUMAN RACE."

AT THE SPRING 2022 meeting of the American Chemistry Society, Wallach drew a standing-room-only crowd. They had come to the San Diego Convention Center to hear him expound on the structure-activity relationship of n-benzylphenethylamines, a class of synthetic hallucinogens collectively called "N-Bomb" on the street. "There were tons of young scientists lining up out in the hall," he says, with a touch of awe.

This hype, and the worry of falling into what Wallach calls "the trap of being a celebrity scientist," doesn't follow him back to the lab. He has plenty to take care of, as Big Neuropharma's patent land grab ramps up and data piles high on his desk. Sitting in his office in West Philly, he shows me a graph on his computer. It's recent head-twitch data, charting how mice responded to various doses of a new drug, the chemical composition of which he cannot legally disclose. The curve slopes gently upward before accelerating steeply, peaking, and driving back down, like the arc of a roller coaster. The line tops out at a dose of 10 mg/kg, or "mig per kig," as chemists pronounce it. I ask Wallach if that's any good. His eyes widen a bit, like he's practically dying to tell me something. "It's a good response," he says. He plucks a sandy-brown glomp of nicotine gum from between his back molars, nests it back in its blister pack, and nods as he trails off, "Very potent … yeah … yeah …"

Maybe, someday soon, that new drug, whatever it is, will be given to human subjects in a Compass-sponsored clinical trial. It may upend pharmacology. Or psychology. It could spark the next revolution in psychedelia. And Wallach can toast his success, with a cigar and a single glass of scotch, as he earns his place among the psychopharmacological saints. Until then, it's charts and graphs and fastidious inventories of structure-activity relationships on reams of graph paper; it's inspirational quotes stuck on fridges full of heady chemical analogs, and funky smells, and the head-twitching tempos of tripped-out mice.

COLOPHON

Influences that helped get this issue out:

Aged white wine; Mexican lager; the *New York Times'* recipe for chocolate chip cookies; Nepalese fashion; the Libby app and my local library; philosophical idealism; dog-sitting for an actual influencer, @beatrice_the_pom; the arcane but enlightening diagrams of the Advanced Astrology subreddit; TikTok's sweet, consumerist siren call of "Hey besties!"; Cadd9; Antony Starr on *The Boys;* catnip and a string toy; successfully subbing butternut squash for chicken; *Set Boundaries, Find Peace: A Guide to Reclaiming Yourself*, by Nedra Glover Tawwab; Instagram girlies pushing the purchase of a unitard; magnesium powder; *The Rehearsal*; an ice cream truck jingle; an array of free samples and a long conversation with the seller of farmers market hibiscus tea; Covid fog.

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THE ASSIGNMENT: IN SIX WORDS, WRITE A STORY SET IN A GALAXY FAR, FAR AWAY.

YOU TURNED *LEFT* AT SIRIUS B?!

—@KuraFire, via Twitter

Honorable Mentions

42 was definitely not the answer.
—Simona Riva, via Facebook

Dear humans, nobody wants unsolicited nudes.
—@OhCooley44, via Twitter

Humans! There goes the dang neighborhood.
—S.V. Mosaic, via Facebook

Is this DC's or Marvel's Universe?
—Thomas Davis, via email

"The robots are BLEEDING!" she screamed.
—@Vince_Freeman, via Twitter

Directions to transdimensional left luggage office?
—Max Thoursie, via email

Want to submit a six-word story for us to consider? At the beginning of each month, we ask for new ideas on Facebook, Twitter, Instagram, and WIRED.com/six-word, where you can also see how we've illustrated past favorites.

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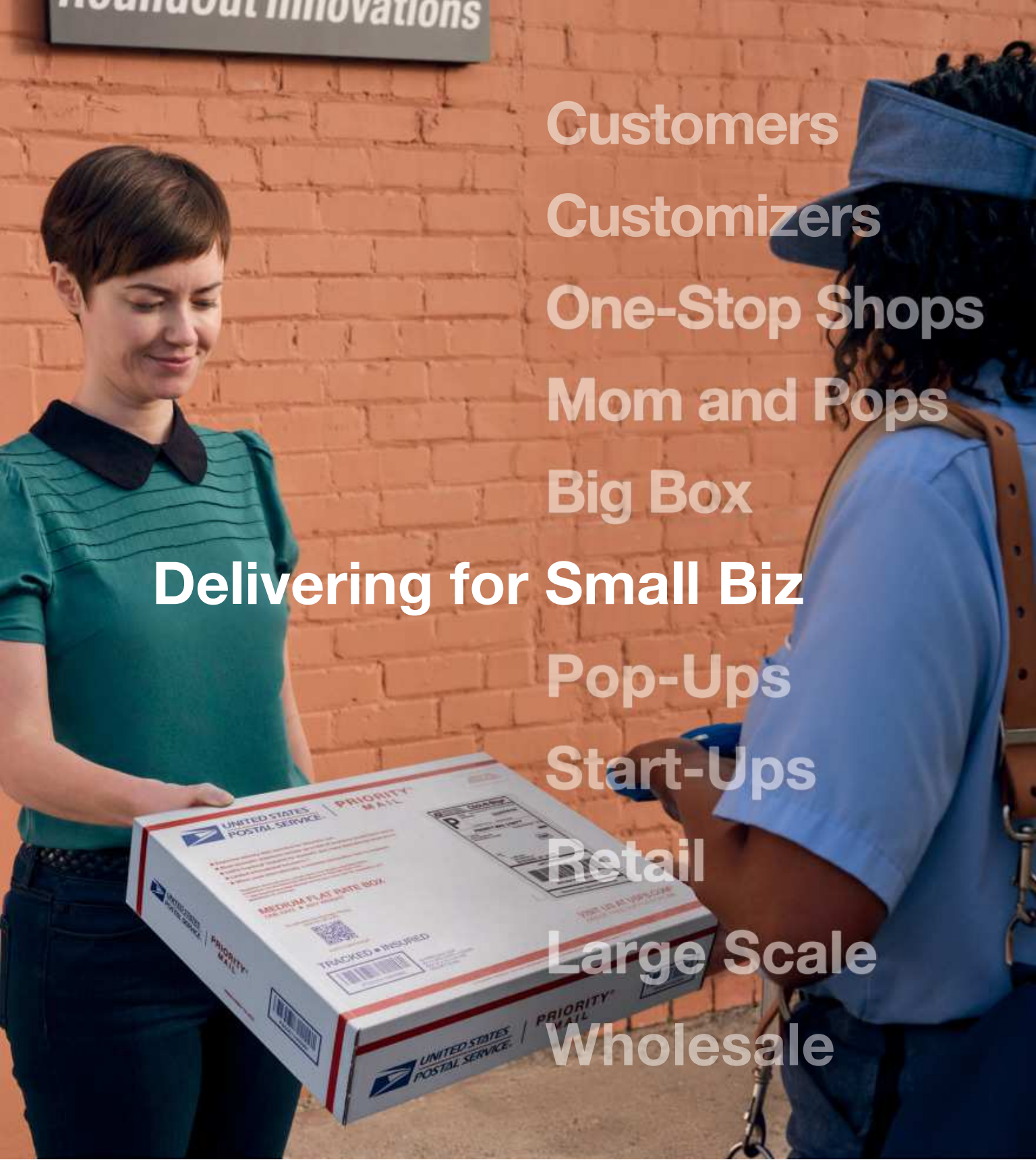

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